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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

March 2000

Data Assimilation
Meteorological Office
London Rd
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Berkshire
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CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.	
Standard of comparison		:Background field from UKMO global model.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (Degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa (pressure) :25 $m\ s^{-1}$ (vector wind)		
SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa ≥ 5 $m\ s^{-1}$ ≥ 30 degrees	(pressure), (wind speed), (direction).
	2.SD	≥ 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25	

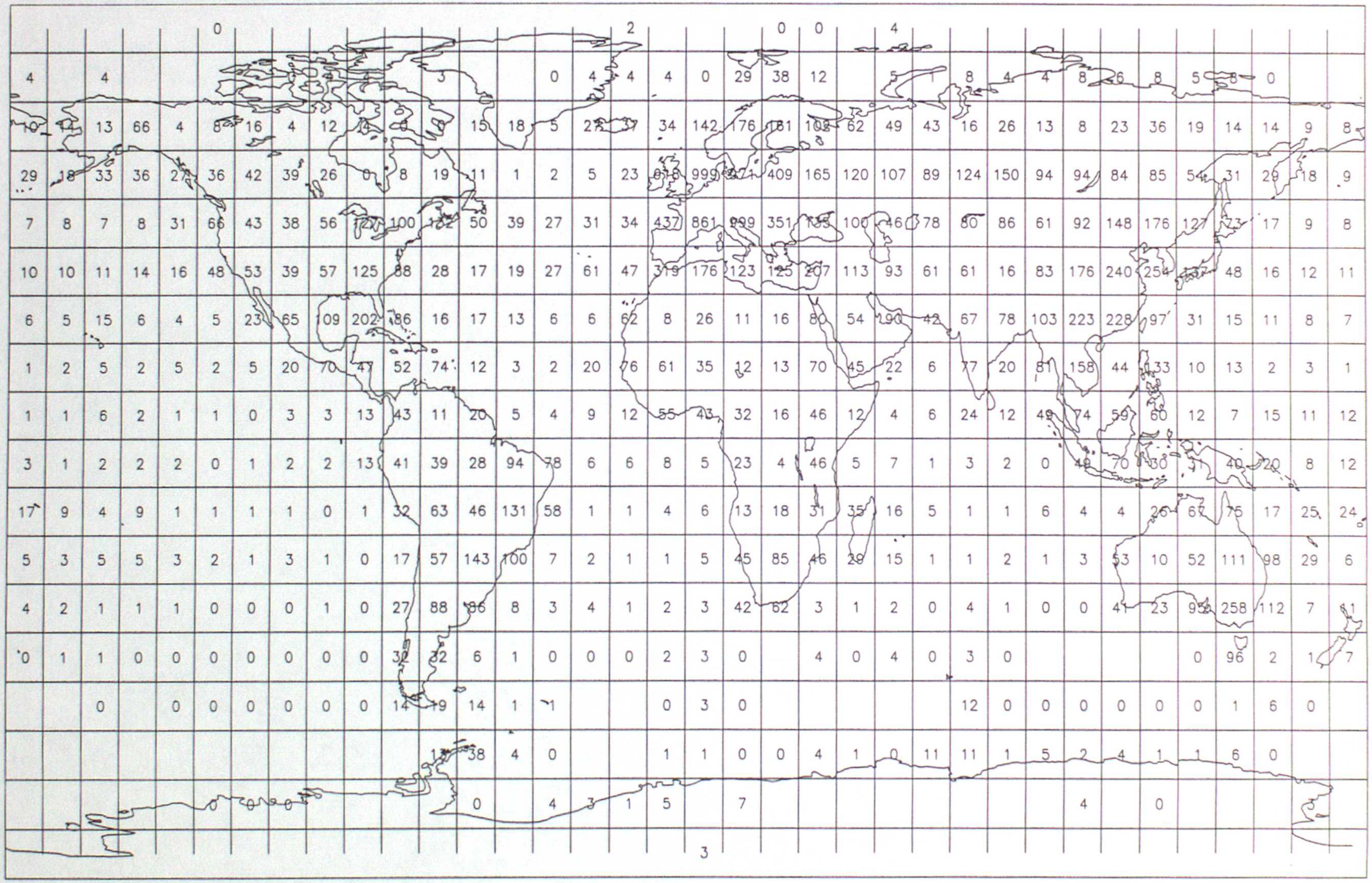
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
DGAF	ALL	P	SUR	60	0	0	1.0	-5.0	5.1
ELMQ	ALL	P	SUR	32	2	6	2.1	-4.0	4.5
ELVI2	ALL	P	SUR	66	0	0	1.6	-4.9	5.2
ELVJ9	ALL	P	SUR	47	0	0	2.0	-4.9	5.3
LAFQ5	ALL	P	SUR	29	0	0	3.2	-4.9	5.8
P3YR5	ALL	P	SUR	41	3	7	6.0	1.1	6.1
TCMM	ALL	P	SUR	76	0	0	3.3	4.3	5.4
UANA	ALL	P	SUR	41	1	2	2.2	-4.3	4.9
UCAD	ALL	P	SUR	28	1	4	1.5	-5.9	6.1
UCJL	ALL	P	SUR	35	1	3	1.9	6.1	6.4
UFNO	ALL	P	SUR	25	0	0	2.3	6.5	6.9
UFXA	ALL	P	SUR	24	0	0	1.1	6.6	6.7
UHRT	ALL	P	SUR	28	0	0	2.0	-4.1	4.6
UIAG	ALL	P	SUR	41	0	0	6.4	0.7	6.5
VCRT	ALL	P	SUR	22	0	0	2.9	-4.6	5.4
VRVV9	ALL	P	SUR	37	15	41	4.8	-7.7	9.1
V7BA6	ALL	P	SUR	21	7	33	4.3	10.7	11.5
WCN3586	ALL	P	SUR	35	1	3	6.2	2.4	6.6
WCX8812	ALL	P	SUR	53	0	0	1.8	4.1	4.5
45132	ALL	P	SUR	161	20	12	2.0	11.3	11.5
48102	ALL	P	SUR	44	44	100			
52045	ALL	P	SUR	198	198	100			
52046	ALL	P	SUR	199	67	34	0.9	-13.7	13.8
62414	ALL	P	SUR	57	7	12	8.2	-0.3	8.2
WIND SPEED									
C6NI3	ALL	SPEED	SUR	30	0	0	4.1	6.0	7.3
DGCDFD	ALL	SPEED	SUR	61	0	0	5.0	7.3	8.8
DJQR	ALL	SPEED	SUR	39	0	0	7.8	7.1	10.6
D5XH	ALL	SPEED	SUR	42	0	0	4.1	5.2	6.6
ELWC6	ALL	SPEED	SUR	27	0	0	7.1	10.3	12.5
KDGA	ALL	SPEED	SUR	25	0	0	4.2	5.5	6.9
SBPO	ALL	SPEED	SUR	34	0	0	7.1	8.2	10.8
SBPR	ALL	SPEED	SUR	71	0	0	3.7	5.3	6.5
SDIA	ALL	SPEED	SUR	51	0	0	3.6	6.2	7.2
SMLQ	ALL	SPEED	SUR	67	0	0	3.2	5.0	6.0
SXYY	ALL	SPEED	SUR	23	0	0	6.2	8.1	10.2
TSMU	ALL	SPEED	SUR	56	0	0	4.2	5.1	6.5
VRUM	ALL	SPEED	SUR	27	0	0	2.9	5.1	5.9
VRVZ4	ALL	SPEED	SUR	22	0	0	1.8	5.7	6.0
VRWE7	ALL	SPEED	SUR	25	0	0	6.9	6.5	9.5
YJYY2	ALL	SPEED	SUR	24	0	0	5.3	7.6	9.2
3FSL4	ALL	SPEED	SUR	29	0	0	2.6	5.7	6.3
62108	ALL	SPEED	SUR	623	0	0	3.0	-5.0	5.8
64045	ALL	SPEED	SUR	513	0	0	4.4	-5.0	6.7
64046	ALL	SPEED	SUR	243	0	0	5.1	-5.3	7.3
WIND DIRECTION									
C4LV	ALL	DIRN.	SUR	30	0	0	56.9	-65.8	86.9
51307	ALL	DIRN.	SUR	36	0	0	90.1	-41.0	99.0
62120	ALL	DIRN.	SUR	245	0	0	16.2	-50.8	53.4

AVAILABILITY – SHIP/SYNOP – MARCH 2000

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21811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29 18 33 36 27 36 42 39 26 0 8 19 11 1 2 5 23 616 999 971 409 165 120 107 89 124 150 94 94 84 85 54 31 29 18 9
7 8 7 8 31 66 43 38 56 127 100 132 50 39 27 31 34 437 861 999 351 135 100 46 78 80 86 61 92 148 176 127 73 17 9 8
10 10 11 14 16 48 53 39 57 125 88 28 17 19 27 61 47 319 176 123 125 207 113 93 61 61 16 83 176 240 254 137 48 16 12 11
6 5 15 6 4 5 23 65 109 202 186 16 17 13 6 6 62 8 26 11 16 80 54 190 42 67 78 103 223 228 97 31 15 11 8 7
1 2 5 2 5 2 5 20 70 47 52 74 12 3 2 20 76 61 35 12 13 70 45 22 6 77 20 81 158 44 133 10 13 2 3 1
1 1 6 2 1 1 0 3 3 13 43 11 20 5 4 9 12 55 43 32 16 46 12 4 6 24 12 49 74 59 60 12 7 15 11 12
3 1 2 2 2 0 1 2 2 13 41 39 28 94 78 6 6 8 5 23 4 46 5 7 1 3 2 0 49 70 30 31 40 20 8 12
17 9 4 9 1 1 1 1 0 1 32 63 46 131 58 1 1 4 6 13 18 31 35 16 5 1 1 6 4 4 26 67 75 17 25 24
5 3 5 5 3 2 1 3 1 0 17 57 143 100 7 2 1 1 5 45 85 46 29 15 1 1 2 1 3 53 10 52 111 98 29 6
4 2 1 1 1 0 0 0 1 0 27 88 86 8 3 4 1 2 3 42 62 3 1 2 0 4 1 0 0 41 23 95 258 112 7 11
0 1 1 0 0 0 0 0 0 0 32 32 6 1 0 0 0 2 3 0 4 0 4 0 3 0 0 96 2 1 7
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13 38 4 0 1 1 0 0 4 1 0 11 11 1 5 2 4 1 1 6 0
0 0 0 0 4 3 1 5 7 4 0 3
3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa :25 $m\ s^{-1}$	(pressure) (vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa ≥ 5 $m\ s^{-1}$ ≥ 30 degrees	(pressure), (wind speed), (direction).
	2.SD	≥ 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25.	

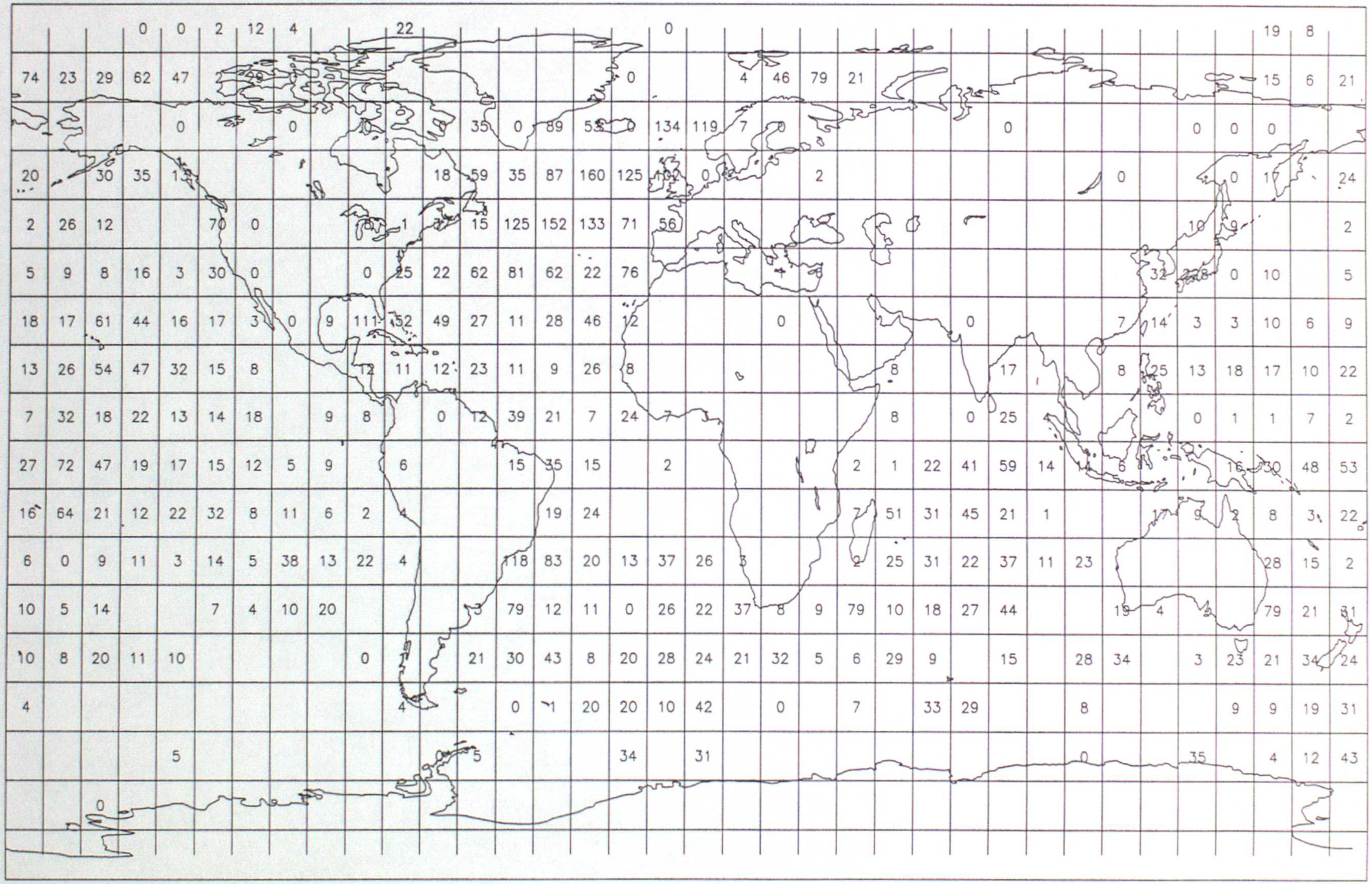
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
15536	-34.3	-28.5	ALL	P	SUR	21	21	100			
17519	-23.9	100.1	ALL	P	SUR	208	32	15	4.7	-6.9	8.4
25565	42.1	-86.6	ALL	P	SUR	198	198	100			
31902	-36.7	-52.8	ALL	P	SUR	71	71	100			
31953	-20.8	-40.7	ALL	P	SUR	691	6	1	2.7	8.4	8.8
31960	-29.8	-37.6	ALL	P	SUR	247	247	100			
33905	-40.4	-28.8	ALL	P	SUR	122	0	0	3.9	6.3	7.4
41853	33.9	-68.1	ALL	P	SUR	222	7	3	3.3	4.4	5.5
44657	47.3	-59.9	ALL	P	SUR	106	103	97	3.0	-0.4	3.0
46517	51.0	153.9	ALL	P	SUR	170	2	1	6.8	0.6	6.8
48575	76.7	-163.5	ALL	P	SUR	397	138	35	4.0	-3.6	5.4
53509	-15.2	59.5	ALL	P	SUR	79	73	92	6.9	7.7	10.3
61534	34.1	31.2	ALL	P	SUR	221	0	0	1.1	10.2	10.3
65600	64.1	-21.9	ALL	P	SUR	41	0	0	1.1	-6.7	6.8
WIND SPEED											
14538	-12.9	54.6	ALL	SPEED	SUR	542	0	0	7.3	5.0	8.8
44773	48.2	-41.1	ALL	SPEED	SUR	137	0	0	2.3	-6.0	6.4
62510	50.4	3.4	ALL	SPEED	SUR	400	0	0	4.1	5.3	6.7
WIND DIRECTION											
17557	-40.2	15.1	ALL	DIRN.	SUR	253	0	0	139.3	-11.5	139.8
44725	43.2	-51.3	ALL	DIRN.	SUR	257	0	0	80.8	24.6	84.5

AVAILABILITY – DRIFTER – MARCH 2000

FIGURE 2

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 7664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2 26 12 70 0 1 15 125 152 133 71 56 10 9 2
5 9 8 16 3 30 0 0 25 22 62 81 62 22 76 32 28 0 10 5
18 17 61 44 16 17 3 0 9 111 52 49 27 11 28 46 12 0 0 7 14 3 3 10 6 9
13 26 54 47 32 15 8 12 11 12 23 11 9 26 8 8 17 8 25 13 18 17 10 22
7 32 18 22 13 14 18 9 8 0 12 39 21 7 24 7 3 8 0 25 4 0 1 1 7 2
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16 64 21 12 22 32 8 11 6 2 4 19 24 7 51 31 45 21 1 17 9 2 8 3 22
6 0 9 11 3 14 5 38 13 22 4 118 83 20 13 37 26 3 2 25 31 22 37 11 23 28 15 2
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10 8 20 11 10 0 21 30 43 8 20 28 24 21 32 5 6 29 9 15 28 34 3 23 21 34 24
4 4 0 1 20 20 10 42 0 7 33 29 8 9 9 19 31
5 5 34 31 0 35 4 12 43
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	119	0	0	0	0.8	5.1	5.2
60468	35.6N	6.2E	1052	S8	117	117	100	0			
60511	35.3N	1.4E	1127	S8	121	112	93	0	0.4	14.4	14.4
60535	34.7N	3.3E	1144	S8	88	0	0	0	0.7	-6.0	6.0
60670	24.6N	9.5E	1054	S8	118	0	0	0	0.7	10.2	10.2
61489	16.5N	15.8W	5	MS	65	17	26	0	0.8	1.4	1.6
63330	13.5N	39.5E	2070	MS	39	39	100	0			
63333	11.1N	39.7E	1903	MS	62	0	0	0	0.8	5.5	5.6
63334	10.3N	37.7E	2515	MS	64	0	0	0	1.4	10.6	10.7
63402	7.7N	36.8E	1725	MS	45	0	0	0	0.8	6.5	6.5
63450	9.0N	38.8E	2354	MS	86	1	1	0	0.7	4.7	4.8
63471	9.6N	41.9E	1260	MS	84	0	0	0	0.9	10.7	10.7
63478	5.9N	43.6E	295	MS	53	1	2	0	0.8	6.3	6.4
63602	3.1N	30.9E	1204	S	46	46	100	0			
63680	0.3N	32.6E	1144	S	31	0	0	6	2.6	-7.4	7.8
68030	18.5S	25.6E	1071	8	32	0	0	0	0.7	4.0	4.1
68106	23.6S	15.1E	407	S	80	36	45	0	1.1	0.5	1.2
68338	26.9S	24.6E	1234	S8	42	36	86	0	0.7	0.9	1.1
68396	26.5S	31.3E	641	S	37	0	0	3	1.1	5.1	5.2

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	32	16	50	0	1.1	-0.2	1.1
30967	49.9N	115.8E	623	MS	87	0	0	0	1.3	-5.3	5.5
40701	39.3N	44.4E	1470	MS	75	0	0	0	1.1	7.9	8.0
40738	36.8N	54.5E	155	MS	73	60	82	51	1.2	13.6	13.7
40741	36.6N	61.2E	235	MS	71	0	0	58	1.4	-5.1	5.3
40743	36.2N	57.7E	941	MS	98	0	0	0	1.0	-5.4	5.5
40762	35.3N	59.2E	1333	MS	98	11	11	1	1.0	-12.8	12.8
40763	35.2N	58.5E	1060	MS	70	0	0	0	0.8	-5.8	5.9
40783	32.4N	49.7E	1972	MS	65	0	0	0	1.2	-5.8	5.9
40789	33.8N	55.1E	921	MS	53	1	2	0	0.9	8.4	8.4
40812	32.0N	49.3E	372	MS	76	2	3	76	1.0	4.8	4.9
40836	30.8N	51.7E	1880	MS	66	0	0	2	1.5	8.3	8.4
40859	29.0N	53.7E	1383	S	71	0	0	1	2.4	9.2	9.5
41254	23.1N	57.7E	1755	S8	86	86	100	0			
41396	16.0N	48.9E	700	MS	41	1	2	0	0.9	7.3	7.4
41535	34.2N	73.3E	1308	8	36	1	3	6	1.7	-5.1	5.4
44239	48.8N	103.6E	1209	MS	119	1	1	0	1.3	-4.0	4.2
44416	28.6N	81.6E	720	MS	44	2	5	2	1.0	4.1	4.2
47022	40.8N	128.2E	1200	S	44	0	0	0	0.8	4.7	4.8
51379	44.0N	89.6E	794	M	124	0	0	0	2.1	4.1	4.6
51495	43.5N	91.6E	874	M	122	0	0	0	1.8	7.8	8.0
52602	38.8N	93.4E	2734	S	124	0	0	0	1.4	-4.3	4.5
52955	35.6N	100.8E	3201	S	124	6	5	0	0.9	13.2	13.2
53588	39.0N	113.5E	2898	S	124	124	100	0			
56444	28.5N	98.9E	3488	S	122	11	9	0	0.6	14.0	14.0
56462	29.0N	101.5E	2994	S	124	0	0	0	1.7	8.7	8.9
57816	26.6N	106.7E	1074	MS	124	24	19	0	2.0	-13.7	13.8
59007	24.1N	105.1E	1251	M	124	1	1	21	2.0	4.2	4.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	38	0	0	0	1.0	-6.8	6.9
82326	3.8S	62.1W	48	MS	91	0	0	0	1.6	4.3	4.6
82704	7.6S	72.7W	170	MS	64	0	0	0	1.4	-4.3	4.5
83214	10.3S	54.9W	285	MS	83	0	0	5	3.4	-5.8	6.7
83235	12.4S	46.4W	604	MS	91	1	1	0	0.9	6.4	6.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83319	14.7S	52.4W	315	MS	87	1	1	1	1.5	-4.7	4.9
83332	14.1S	46.4W	826	MS	90	3	3	0	0.8	13.0	13.0
83408	14.3S	43.8W	447	MS	85	1	1	1	0.8	10.3	10.3
83423	16.7S	49.3W	741	MS	91	0	0	0	0.8	-4.7	4.8
83488	17.8S	42.9W	1097	MS	91	91	100	0			
83531	18.6S	46.5W	940	MS	79	0	0	1	1.4	-6.5	6.6
83587	19.9S	43.9W	850	MS	93	0	0	1	1.0	-6.9	7.0
83704	22.3S	53.9W	369	MS	88	0	0	1	1.4	-9.6	9.7
83773	23.1S	48.9W	793	MS	53	53	100	60			
83836	25.5S	50.6W	837	MS	93	0	0	0	1.0	-4.6	4.7
83953	30.9S	55.5W	231	MS	93	1	1	1	1.0	-10.7	10.7
84377	3.8S	73.3W	125	MS	114	1	1	1	1.8	4.1	4.5
84425	5.9S	76.1W	179	MS	55	1	2	0	1.3	5.2	5.4
84455	6.5S	76.4W	281	MS	85	0	0	0	1.4	5.1	5.3
84472	7.1S	78.5W	2620	S	58	0	0	3	2.7	-5.6	6.2
84474	7.2S	76.7W	350	S	57	0	0	0	1.6	10.0	10.1
84542	9.4S	77.6W	2750	S	52	0	0	2	1.1	5.2	5.3
84686	13.6S	72.0W	3248	S	112	1	1	0	0.7	-4.3	4.4
84688	13.7S	73.4W	3444	S	50	0	0	2	1.0	-11.6	11.6
84782	18.1S	70.3W	468	MS	113	0	0	0	1.2	7.1	7.2
85140	14.3S	67.4W	140	MS	58	0	0	12	1.9	4.3	4.7
85230	17.6S	69.6W	4054	S	48	0	0	2	1.6	5.0	5.2
85264	18.5S	64.1W	1998	S	53	52	98	66	0.0	-14.6	14.6
85312	19.8S	63.9W	992	S	43	2	5	2	1.2	-9.0	9.1
85432	22.5S	68.9W	2320	S8	85	0	0	0	0.6	6.0	6.0

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70194	66.6N	145.3W	431	S	92	42	46	0	0.9	-0.3	0.9
71082	82.5N	62.3W	30	MS	124	3	2	6	3.5	4.2	5.5
71492	69.2N	122.4W	552	MS	123	0	0	0	1.3	-4.2	4.4
71506	66.9N	136.3W	600	MS	86	85	99	100	0.0	-14.4	14.4
71812	49.8N	77.8W	281	MS	124	54	44	0	1.3	-0.7	1.5
76055	31.0N	114.9W	440	MS	61	30	49	2	2.0	-0.4	2.0
76118	30.4N	109.7W	1040	MS	39	0	0	0	0.7	-12.3	12.3
76632	20.1N	98.7W	2417	MS	36	0	0	0	0.7	-4.6	4.7
76658	19.2N	103.7W	494	MS	48	0	0	0	0.7	7.1	7.1
76750	18.5N	88.3W	9	MS	113	0	0	2	1.7	-8.4	8.6
76773	17.8N	97.8W	1680	MS	44	0	0	2	1.2	8.2	8.3
76775	17.1N	96.7W	1550	MS	86	0	0	0	0.7	4.4	4.5
76845	16.7N	92.6W	2276	MS	55	55	100	0			
78718	14.4N	87.6W	626	MS	22	16	73	0	0.9	-1.8	2.0

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	348	348	100	0			
92010	6.1S	145.4E	1587	M	49	0	0	0	0.8	9.9	9.9
95611	34.6S	118.5E	107	MS	111	0	0	1	2.3	9.7	10.0
95909	36.5S	148.3E	1957	MS	123	123	100	0			
96751	6.7S	106.9E	920	S8	47	1	2	0	0.9	-4.1	4.2
96755	6.6S	106.9E	171	S	33	10	30	15	0.5	1.1	1.2
96801	7.3S	108.3E	335	MS	34	14	41	0	1.0	2.4	2.6

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.8N	9.7E	671	MS	50	0	0	98	1.3	7.6	7.7
10557	50.5N	11.1E	845	S8	372	372	100	0			
10954	47.8N	10.9E	540	S8	206	206	100	0			
12140	54.4N	18.7E	2	MS	120	0	0	0	0.8	7.8	7.8
13269	44.3N	19.9E	176	MS	96	1	1	0	1.2	7.5	7.6
14554	44.9N	18.4E	140	S	31	1	3	0	1.1	-13.4	13.4
14650	43.8N	18.0E	967	S	33	0	0	0	1.4	-6.2	6.4
16470	36.8N	12.0E	191	MS	73	0	0	0	0.7	-4.1	4.2
17042	41.4N	41.4E	33	M	95	0	0	1	1.8	6.0	6.3
17092	39.8N	39.5E	1218	S8	112	0	0	0	1.6	9.2	9.3
17203	38.9N	40.5E	1177	S8	95	0	0	0	1.3	5.8	5.9

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89208	90.0S	0.0W	2835	M	52	46	88	0	1.0	1.0	1.4
89264	71.4S	68.9W	780	S	269	0	0	0	1.2	5.8	5.9
89266	72.2S	60.3W	91	S	252	248	98	0	7.3	-8.9	11.5
89272	75.0S	70.8W	1395	S	261	261	100	28			
89327	73.2S	127.1W	30	S	259	256	99	0	0.4	-14.5	14.5
89612	66.3S	110.8E	390	S	253	253	100	0			
89744	74.0S	43.0E	3353	S	273	0	0	0	0.9	7.1	7.2
89769	78.5S	168.4E	50	S	398	398	100	0			
89805	74.1S	109.8E	3096	S	243	77	32	0	2.4	3.2	4.0
89847	67.6S	146.0E	30	S	307	0	0	0	1.9	-9.3	9.5

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAA	51	0	49	1.8	0.9	51	0	47	0	7.9	0.4
AAH	894	1	40	1.9	0.1	897	0	40	0	8.5	1.3
AAL	7228	0	16	1.6	0.1	7167	0	16	0	8.5	1.2
AAR	1651	0	9	2.0	-0.4	1647	0	9	0	9.3	0.4
ACA	2289	0	5	2.0	0.0	2299	0	5	0	7.2	0.8
ACI	41	5	61	0.8	0.3	41	0	59	0	8.6	3.4
AEA	588	2	6	2.2	0.6	572	0	5	0	7.4	0.9
AEL	795	1	8	1.9	-0.5	790	0	9	0	7.7	0.5
AEY	305	1	5	1.9	0.8	306	0	4	0	8.0	1.0
AFL	575	1	3	1.6	0.1	571	1	4	0	7.6	0.2
AFR	2240	1	8	1.7	0.0	2252	0	9	0	8.2	0.9
AIH	383	2	4	1.8	0.0	387	0	3	0	6.9	0.4
AJM	174	0	2	2.0	-0.6	172	0	2	0	6.6	1.8
AMM	154	2	8	2.0	0.3	150	0	9	0	9.9	0.8
AMT	746	2	49	3.4	2.2	755	0	45	0	9.5	1.5
AMX	323	2	7	1.9	0.3	325	0	7	0	10.4	1.2
ANA	1456	0	10	2.0	0.0	1454	0	11	0	8.7	0.3
ANZ	4639	1	44	1.5	0.2	4606	0	44	0	7.7	1.2
AOM	1236	1	9	1.7	0.6	1251	0	8	0	8.2	0.9
ARG	114	2	21	2.9	1.3	114	0	20	0	10.6	1.6
AUA	38	3	3	1.4	0.6	38	0	0	0	5.5	1.3
AVA	599	1	3	1.8	0.0	602	0	4	0	9.8	0.8
AVN	104	1	32	0.8	0.3	103	0	32	0	6.8	0.3
AXF	93	10	44	1.5	0.5	84	0	42	0	11.9	1.7
AZA	833	1	5	2.0	0.4	830	0	5	0	7.7	0.8
BAF	26	0	0	1.5	-0.8	26	0	4	0	8.2	2.1
BAL	401	1	7	1.7	0.0	400	0	8	0	7.3	1.2
BAW	1928	1	6	1.8	0.0	1919	0	7	0	6.8	0.9
BBB	81	0	1	1.4	-0.3	78	0	3	0	8.3	1.0
BLX	51	0	0	1.2	-0.2	50	0	0	0	5.1	0.8
BWA	376	1	8	1.9	1.1	375	1	11	0	10.4	0.7
CAL	475	0	8	1.7	0.2	486	1	9	0	9.2	1.0
CCA	234	2	100	2.8	0.5	262	1	100	0	14.6	-0.2
CDN	2331	0	7	1.9	-0.1	2349	0	8	0	8.8	0.8
CES	343	0	8	2.2	0.3	352	3	100	0	11.1	-0.1
CFC	39	0	13	2.4	-0.2	39	0	21	0	13.5	4.0
CFG	1631	0	4	1.8	-1.0	1637	0	4	0	7.9	0.8
CKS	304	0	35	1.6	0.4	301	0	35	0	7.1	1.2
CKT	154	1	12	2.5	1.3	148	1	12	0	8.6	0.9
CLX	460	2	5	1.6	-0.4	459	0	4	0	6.2	-0.3
CMI	484	0	2	1.7	0.7	499	0	3	0	9.1	1.0
CMM	435	2	28	2.4	0.0	423	0	26	0	9.6	2.1
COA	1419	1	27	1.5	0.2	1411	0	29	0	10.1	1.7
CPA	77	0	9	1.5	0.6	77	0	9	0	5.1	0.8
CRL	1045	0	6	1.8	0.8	1044	0	6	0	8.0	0.9
CSN	126	0	6	2.4	1.5	128	0	9	0	10.3	-0.3
CTB	222	0	4	1.4	-0.1	221	0	5	0	7.0	0.8
CTM	30	3	20	2.6	-1.2	34	0	21	0	7.6	2.3
CUB	389	1	3	2.0	1.4	387	0	4	0	8.6	1.4
DAF	26	0	0	2.1	-0.8	25	0	0	0	7.8	2.5
DAJ	22	0	0	1.2	0.4	23	0	0	0	8.0	1.2
DAL	4378	0	31	1.6	0.3	4418	0	32	0	7.8	1.2
DBY	606	0	2	1.6	-0.6	592	0	2	0	8.0	0.7
DCS	57	0	5	1.6	-0.3	58	0	3	0	5.8	-0.6
DLH	2477	0	5	1.7	0.1	2476	0	5	0	7.2	0.7
EEZ	295	4	100	5.0	3.4	291	0	10	0	8.4	1.0
EIA	354	1	42	1.8	0.4	349	0	43	0	10.6	1.5
EIN	43	2	5	1.4	-0.6	42	0	2	0	5.2	-0.1
ELY	162	1	3	1.3	-0.4	167	0	5	0	8.9	1.2

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
ETH	25	0	16	1.5	0.2	25	0	16	0	7.8	1.5
EVA	1464	0	5	1.8	-0.3	1497	0	5	0	8.3	0.2
EWW	81	0	7	1.8	0.1	82	0	9	0	8.7	2.0
FDX	1882	0	19	1.6	0.5	1891	0	20	0	8.9	1.0
FIN	479	0	4	1.9	0.2	478	0	6	0	8.3	0.8
FJI	973	7	46	1.6	0.5	917	0	43	0	8.5	2.1
FOM	377	7	45	1.5	0.5	345	0	41	0	7.6	1.1
FWQ	20	10	50	1.1	0.1	20	0	45	0	4.4	1.2
GAF	74	0	0	1.8	-1.0	74	0	1	0	8.8	1.4
GCO	47	2	4	1.0	0.5	50	0	16	0	18.0	3.9
GHA	46	7	7	1.7	-0.6	47	0	6	0	12.5	-2.3
GIA	47	2	9	1.5	0.9	49	2	8	0	6.8	1.9
GRL	85	1	2	1.8	0.2	86	0	1	0	5.8	-0.8
GTI	263	0	5	1.7	-0.5	272	0	7	0	7.8	0.8
HAL	4271	0	38	1.7	0.6	4212	0	38	0	10.4	1.9
HLF	120	2	6	1.5	-0.9	116	0	6	0	8.2	1.2
HLQ	87	0	11	1.9	1.0	87	0	11	0	7.2	0.9
HRH	213	9	67	1.1	0.2	196	0	64	0	10.9	2.2
HVN	31	0	0	0.9	0.0	31	0	0	0	5.6	1.1
IBE	3099	1	8	2.1	0.6	3033	0	8	0	9.0	0.6
ICE	1326	0	3	1.7	0.0	1313	0	4	0	7.7	1.2
IRL	26	0	4	2.8	2.0	28	0	0	0	7.5	2.0
IWD	223	0	4	1.7	-0.3	217	0	3	0	7.8	1.3
JAA	76	0	5	2.6	1.8	77	0	6	0	9.0	3.6
JAL	7001	0	5	1.9	0.3	7018	0	6	0	9.0	0.8
JAZ	413	0	5	2.0	1.3	412	0	5	0	7.8	0.6
JKK	297	1	7	1.6	-0.1	261	0	8	0	8.3	1.3
JMC	44	0	5	2.2	1.4	38	0	8	0	7.9	0.5
KAL	3735	1	10	1.9	-0.3	3734	0	11	0	9.5	0.5
KIW	22	5	59	2.5	2.4	21	0	57	0	7.0	3.5
KLM	2958	0	13	1.6	0.3	2965	0	14	0	7.7	0.8
LAN	69	6	16	2.5	1.4	71	0	13	0	9.6	1.8
LAP	59	5	27	2.0	1.0	58	0	22	0	6.7	2.2
LDA	167	1	7	1.7	-0.3	169	0	6	0	8.0	1.1
LDI	933	1	100	2.5	0.2	921	0	9	0	8.1	0.3
LIB	462	1	3	1.8	1.1	463	0	5	0	9.6	1.0
LOB	21	90	95	6.4	5.7	22	0	23	0	15.4	0.1
LOT	246	0	6	2.0	-1.1	243	0	5	0	9.3	0.6
LPR	39	10	13	2.1	0.5	39	0	3	0	7.2	3.1
LTE	21	0	0	1.8	-0.6	21	0	0	0	6.2	1.1
LTU	845	0	4	1.9	-0.2	829	0	5	0	8.0	1.1
MAS	390	1	9	2.1	0.3	396	0	9	0	8.9	0.3
MMZ	43	2	2	1.8	0.9	43	0	0	0	7.3	2.3
MON	170	1	4	1.7	0.0	168	0	4	0	7.1	1.0
MPD	314	1	7	1.8	0.1	309	1	7	0	8.2	1.1
MPH	970	0	4	1.9	-0.6	973	0	3	0	7.6	0.9
NCA	729	0	3	1.8	0.3	726	0	5	0	8.8	0.3
NVR	61	0	7	2.1	0.2	62	0	5	0	5.3	0.1
NWA	11225	0	13	1.9	0.6	11101	0	14	0	8.7	0.6
OAE	55	0	45	1.2	0.2	55	0	45	0	6.9	1.7
OAL	30	3	7	2.0	-0.5	30	0	0	0	6.9	1.1
PAC	274	1	31	1.8	0.5	276	0	50	0	7.1	1.4
PAL	1366	1	15	1.7	-0.3	1301	0	16	0	9.7	0.5
PAO	296	11	65	1.5	0.4	262	0	61	0	8.6	1.1
PUA	37	0	46	3.0	1.6	37	0	46	0	16.7	0.4
QFA	2136	1	56	1.5	0.4	2130	0	56	0	7.7	0.8
RAF	105	0	0	2.1	1.2	105	0	0	0	8.5	1.1
RAM	73	0	7	1.7	-0.9	72	0	11	0	9.9	-0.6
RCH	306	1	11	2.1	0.9	290	0	68	0	9.5	0.8

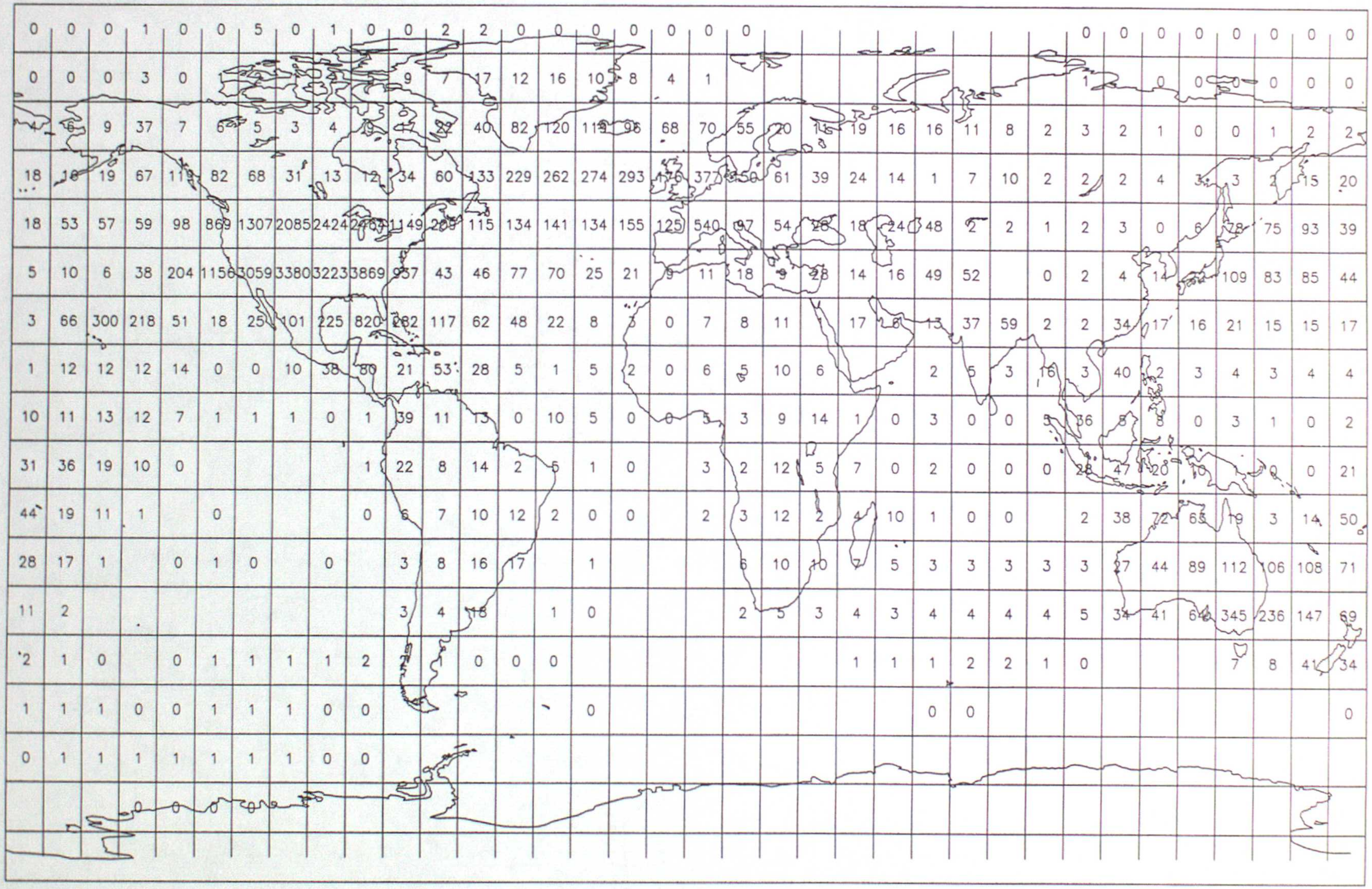
		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RJA	41	2	2	1.3	-0.5	42	0	5	0	11.4	2.6
RKA	110	1	5	1.9	-1.2	109	0	5	0	9.7	0.0
ROY	28	0	21	2.1	0.2	32	0	25	0	11.8	0.5
RRR	139	4	17	1.8	-0.3	142	1	14	0	6.4	1.2
RYN	425	3	46	2.0	1.0	423	0	44	0	8.0	0.5
RZO	151	1	3	1.9	-0.6	150	0	4	0	8.9	0.7
SAA	382	1	6	2.0	-0.7	377	0	6	0	8.5	0.7
SAB	60	0	5	2.0	-0.9	60	0	3	0	6.3	1.7
SAS	1855	0	34	1.7	-0.3	1850	0	34	0	7.2	0.4
SIA	462	1	10	1.7	0.0	462	0	9	0	7.1	0.5
SLR	253	0	10	1.8	-1.1	250	1	11	0	7.3	0.5
SNB	91	0	7	2.4	0.1	92	0	4	0	6.6	-0.1
SOL	81	0	28	3.5	2.3	74	0	31	0	9.5	1.0
SVA	154	1	8	1.8	-0.3	158	0	8	0	7.4	0.6
SWR	160	1	5	1.4	0.2	158	1	8	0	9.7	1.6
TAP	554	2	10	1.9	-0.1	548	0	10	0	9.7	0.8
TBA	38	11	53	3.1	0.8	38	0	47	0	15.4	-1.4
TCU	36	0	3	1.9	-0.8	36	0	6	0	9.9	-0.1
THA	262	1	7	2.1	-0.5	263	0	9	0	11.4	-0.3
THT	96	1	26	2.0	0.0	94	0	23	0	8.5	2.5
TOW	65	2	6	1.2	-0.2	65	0	6	0	9.9	1.1
TPA	47	0	2	1.2	0.0	49	0	2	0	6.3	0.1
TSC	160	3	21	2.3	1.3	155	0	19	0	9.7	1.2
TWA	1764	0	15	1.6	0.2	1712	0	16	0	7.7	1.4
UAL	117652	0	94	1.5	-0.1	117551	0	94	0	6.9	1.0
UPS	1617	0	22	1.9	0.6	1625	0	22	0	7.6	1.0
USA	362	0	2	1.6	-0.2	306	0	2	0	6.6	1.1
VIR	877	0	2	1.8	-0.2	877	0	2	0	7.4	0.7
VKG	223	0	2	1.9	-0.3	225	0	3	0	7.7	0.4
VPB	39	3	10	2.1	1.1	40	0	10	0	7.2	1.2
VRG	232	1	26	2.2	1.3	243	0	26	0	10.6	1.2
VSP	21	0	43	1.7	1.3	20	0	45	0	6.5	2.3
VVR	87	1	36	3.0	1.7	88	0	35	0	10.6	1.6
WOA	145	0	5	2.0	0.2	156	0	5	0	9.1	1.8
AN	19833	0	18	1.1	0.3	19833	0	18	0	5.7	0.6
AR	2018	1	100	3.0	2.7	2004	0	6	0	7.5	2.0
BA	9221	0	10	1.4	0.4	9139	0	10	0	6.3	1.0
EH	71	0	1	1.5	1.0	71	0	1	0	6.4	0.2
EU	61766	0	22	1.3	0.0	61766	0	22	0	5.7	0.6
KL	7213	0	9	1.4	0.7	7162	0	9	0	6.4	1.0
MK	3693	0	5	1.6	1.1	3670	0	5	0	6.8	1.1
NZ	2794	0	12	1.1	0.1	2794	0	12	0	6.6	0.7
QF	33427	0	13	1.3	0.6	33418	0	13	0	6.0	0.7
SA	2312	1	4	1.9	1.4	2306	0	4	0	7.0	0.6
WA	414	7	14	2.2	0.6	403	7	100	0	15.4	-2.2
XX	5408	2	8	1.8	0.4	6163	0	100	0	11.5	1.2
N	734	2	23	2.5	0.7	761	0	22	0	7.9	1.3
US ACARS	569169	0	49	1.6	0.3	568019	0	50	0	7.0	1.2

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

MARCH 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3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18 18 19 67 119 82 68 31 13 12 34 60 133 229 262 274 293 176 377 350 61 39 24 14 1 7 10 2 2 2 4 3 3 2 15 20
18 53 57 59 98 869 1307 2085 2424 2467 1149 209 115 134 141 134 155 125 540 97 54 28 18 24 48 2 2 1 2 3 0 6 78 75 93 39
5 10 6 38 204 1156 3059 3380 3223 3869 937 43 46 77 70 25 21 9 11 18 9 28 14 16 49 52 0 2 4 14 109 83 85 44
3 66 300 218 51 18 25 101 225 820 282 117 62 48 22 8 3 0 7 8 11 1 17 26 13 37 59 2 2 34 17 16 21 15 15 17
1 12 12 12 14 0 0 10 38 80 21 53 28 5 1 5 2 0 6 5 10 6 2 5 3 16 3 40 2 3 4 3 4 4
10 11 13 12 7 1 1 1 0 1 39 11 13 0 10 5 0 0 5 3 9 14 1 0 3 0 0 5 36 8 8 0 3 1 0 2
31 36 19 10 0 1 22 8 14 2 5 1 0 3 2 12 5 7 0 2 0 0 0 28 47 20 10 1 0 0 21
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28 17 1 0 1 0 0 3 8 16 17 1 6 10 10 7 5 3 3 3 3 3 27 44 89 112 106 108 71
11 2 3 4 18 1 0 2 5 3 4 3 4 4 4 4 5 34 41 64 345 236 147 69
2 1 0 0 1 1 1 1 2 2 1 0 0 0 1 1 1 2 2 1 0 7 8 41 34
1 1 1 0 0 1 1 1 0 0 0 0 0 0
0 1 1 1 1 1 1 1 0 0
0 0 0 0

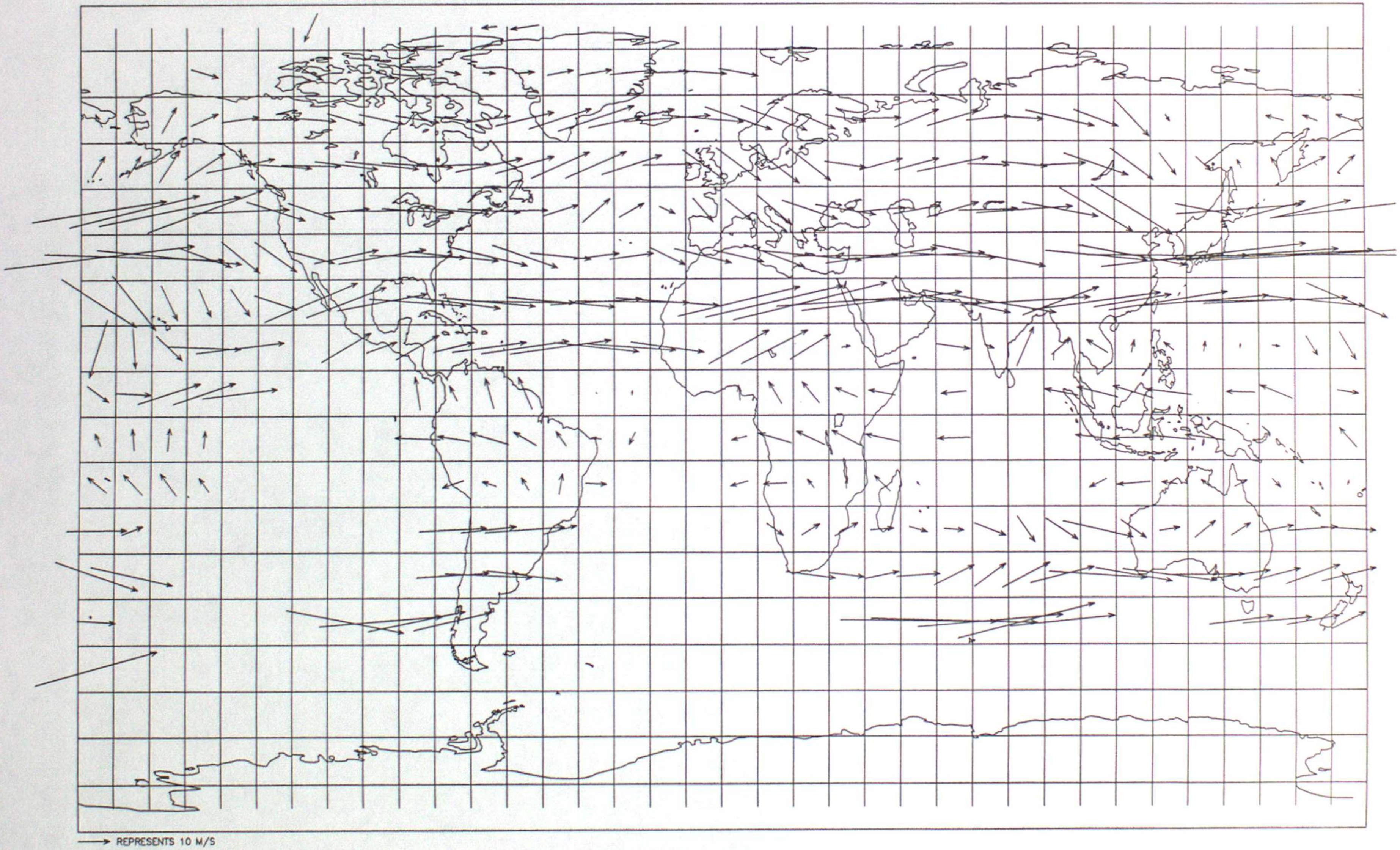
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

MARCH 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



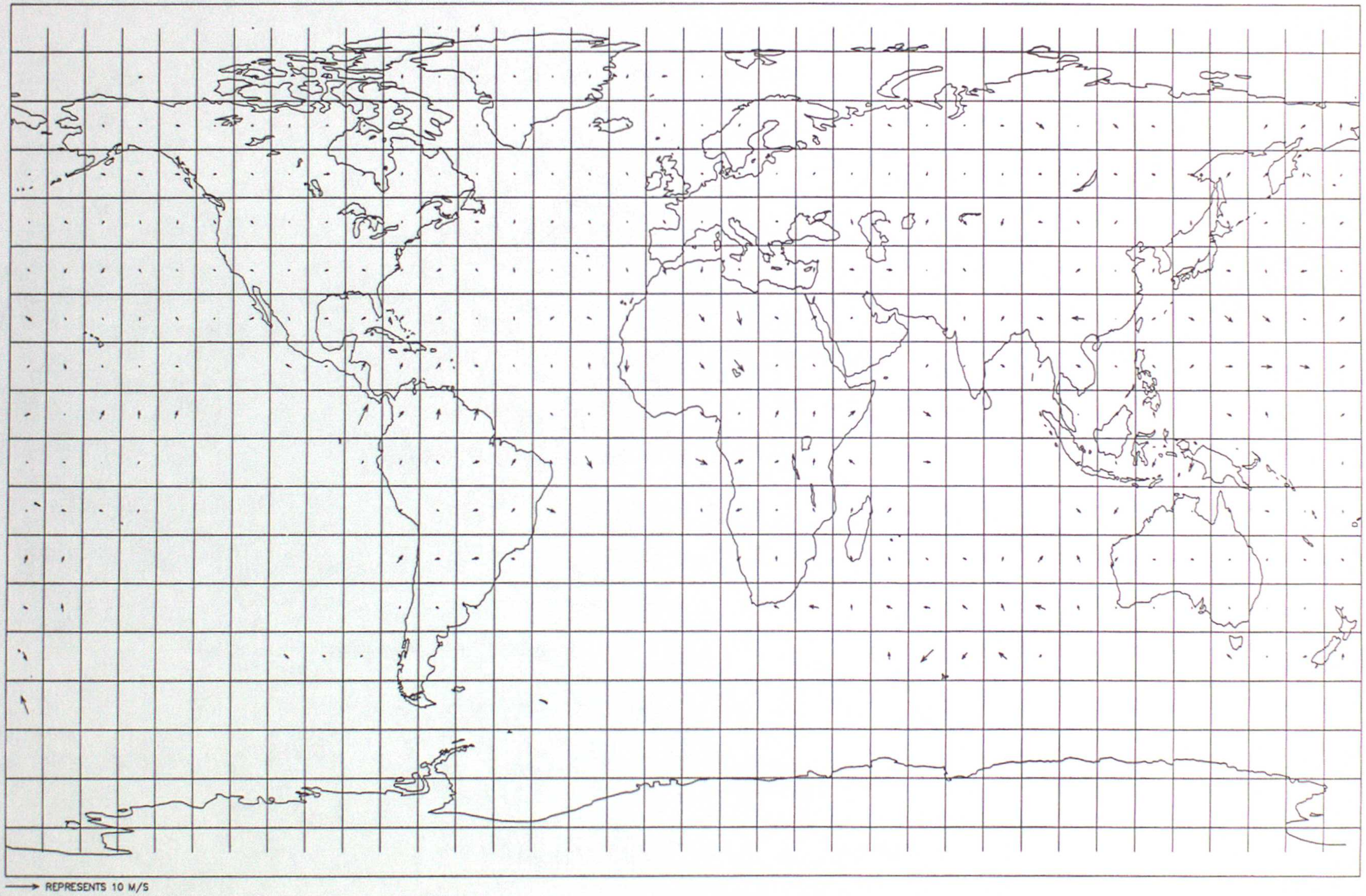
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

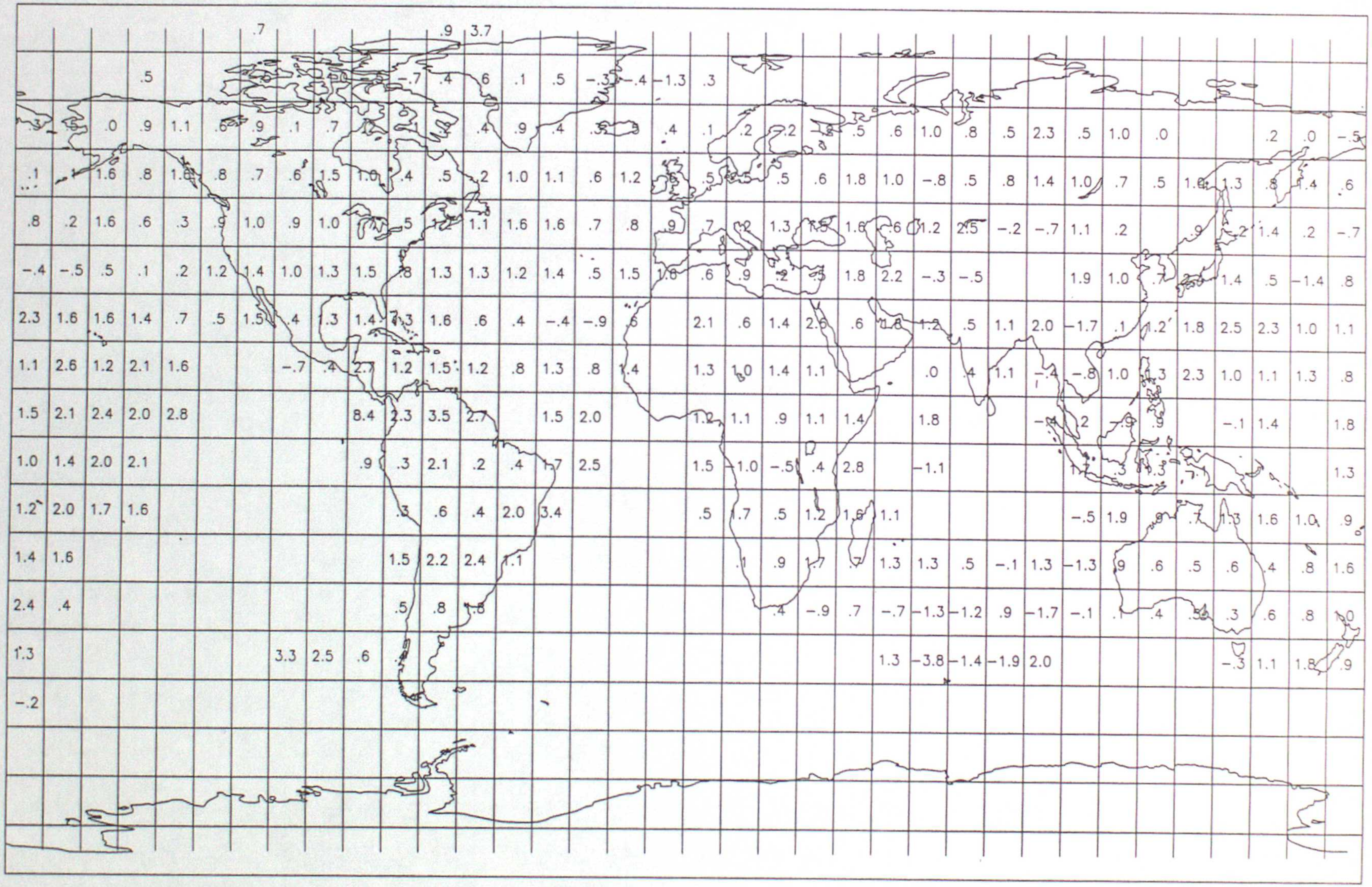
MARCH 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
MARCH 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



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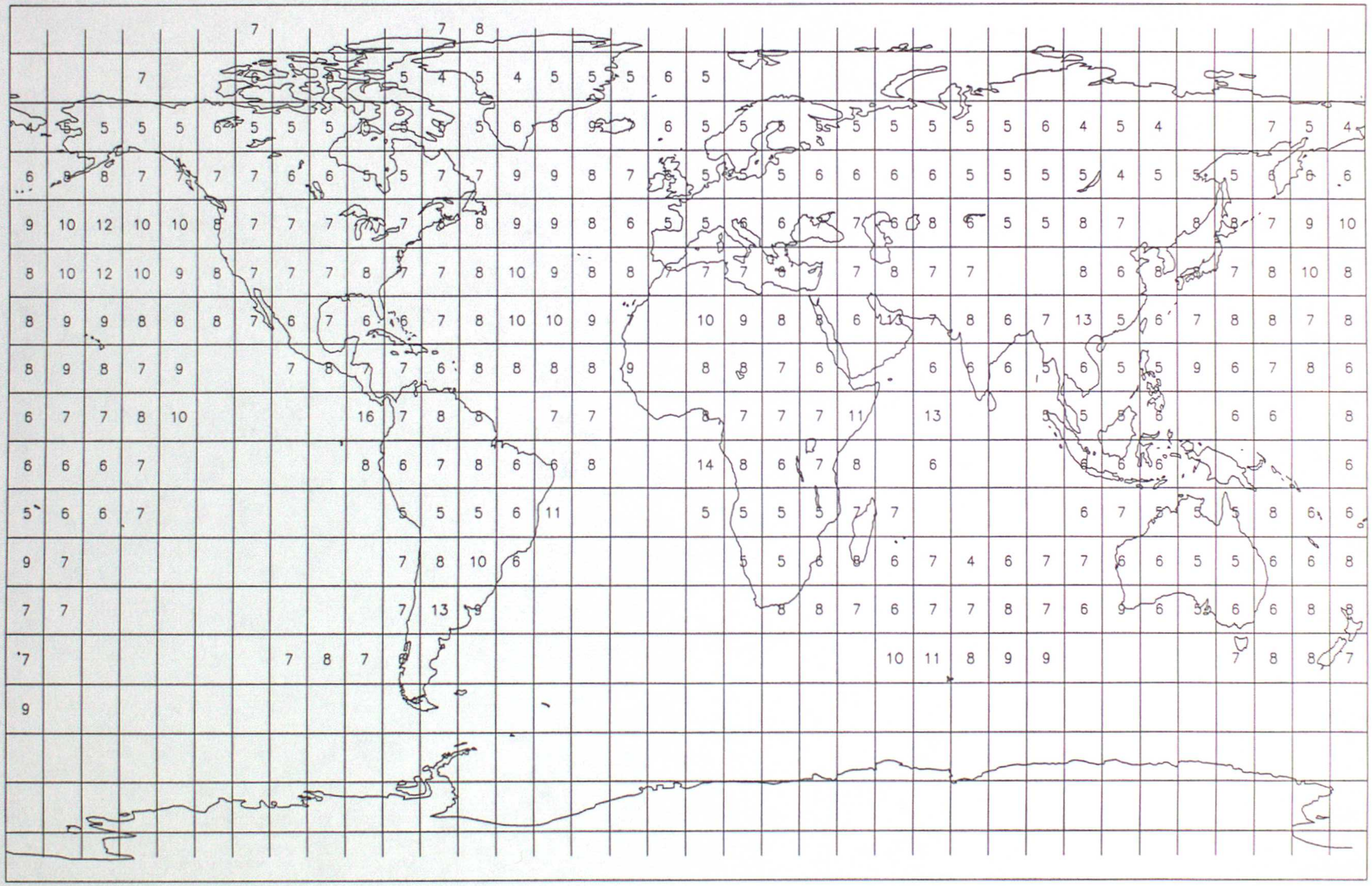
.5 -.7 .4 .6 .1 .5 -.3 -.4 -1.3 .3
.3 .5 .0 .9 1.1 .6 .9 .1 .7 .4 .9 .4 .3 .3 .4 .1 .2 .2 .2 .5 .6 1.0 .8 .5 2.3 .5 1.0 .0 .2 .0 -.5
.1 .1 1.6 .8 1.6 .8 .7 .6 1.5 1.0 .4 .5 .2 1.0 1.1 .6 1.2 .6 .5 .5 .5 .6 1.8 1.0 -.8 .5 .8 1.4 1.0 .7 .5 1.6 1.3 .8 1.4 .6
.8 .2 1.6 .6 .3 .9 1.0 .9 1.0 .5 1.2 1.1 1.6 1.6 .7 .8 .9 .7 .2 1.3 1.5 1.6 .6 1.2 2.5 -.2 -.7 1.1 .2 .9 .2 1.4 .2 -.7
-.4 -.5 .5 .1 .2 1.2 1.4 1.0 1.3 1.5 .8 1.3 1.3 1.2 1.4 .5 1.5 1.6 .6 .9 .2 .5 1.8 2.2 -.3 -.5 1.9 1.0 .7 1.4 .5 -1.4 .8
2.3 1.6 1.6 1.4 .7 .5 1.5 .4 1.3 1.4 1.3 1.6 .6 .4 -.4 -.9 .6 2.1 .6 1.4 2.6 .6 1.6 1.2 .5 1.1 2.0 -1.7 .1 1.2 1.8 2.5 2.3 1.0 1.1
1.1 2.6 1.2 2.1 1.6 -.7 .4 2.7 1.2 1.5 1.2 .8 1.3 .8 1.4 1.3 1.0 1.4 1.1 .0 .4 1.1 -.4 -.8 1.0 1.3 2.3 1.0 1.1 1.3 .8
1.5 2.1 2.4 2.0 2.8 8.4 2.3 3.5 2.7 1.5 2.0 1.2 1.1 .9 1.1 1.4 1.8 -.4 .2 -.9 .9 -.1 1.4 1.8
1.0 1.4 2.0 2.1 .9 .3 2.1 .2 .4 1.7 2.5 1.5 1.0 -.5 .4 2.8 -1.1 1.7 .3 1.3 .7 1.3
1.2 2.0 1.7 1.6 .3 .6 .4 2.0 3.4 .5 1.7 .5 1.2 1.6 1.1 -.5 1.9 .9 .7 1.3 1.6 1.0 .9
1.4 1.6 1.5 2.2 2.4 1.1 .1 .9 1.7 .7 1.3 1.3 .5 -.1 1.3 -1.3 .9 .6 .5 .6 .4 .8 1.6
2.4 .4 .5 .8 1.8 .4 -.9 .7 -.7 -1.3 -1.2 .9 -1.7 -.1 .1 .4 .5 .3 .6 .8 .0
1.3 3.3 2.5 .6 .4 1.3 -3.8 -1.4 -1.9 2.0 -.3 1.1 1.8 .9
-.2

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
MARCH 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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8 10 12 10 9 8 7 7 7 8 7 7 8 10 9 8 8 7 7 7 8 7 7 8 7 7 8 6 8 8 7 8 10 8
8 9 9 8 8 8 7 6 7 6 6 7 8 10 10 9 7 10 9 8 8 6 13 7 8 6 7 13 5 6 7 8 8 7 8
8 9 8 7 9 7 8 7 7 6 8 8 8 8 9 8 8 7 6 6 6 6 5 6 5 5 9 6 7 8 6
6 7 7 8 10 16 7 8 8 7 7 8 7 7 7 11 13 5 5 8 6 6 6 8
6 6 6 7 8 6 7 8 6 6 8 14 8 6 7 8 6 6 6 6 6
5 6 6 7 5 5 5 6 11 5 5 5 5 7 7 6 7 5 5 5 8 6 6
9 7 7 8 10 6 5 5 6 8 6 7 4 6 7 7 6 6 5 5 6 6 8
7 7 7 13 9 8 8 7 6 7 7 8 7 6 9 6 5 6 6 8 8
7 7 8 7 8 10 11 8 9 9 7 8 8 7
9

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

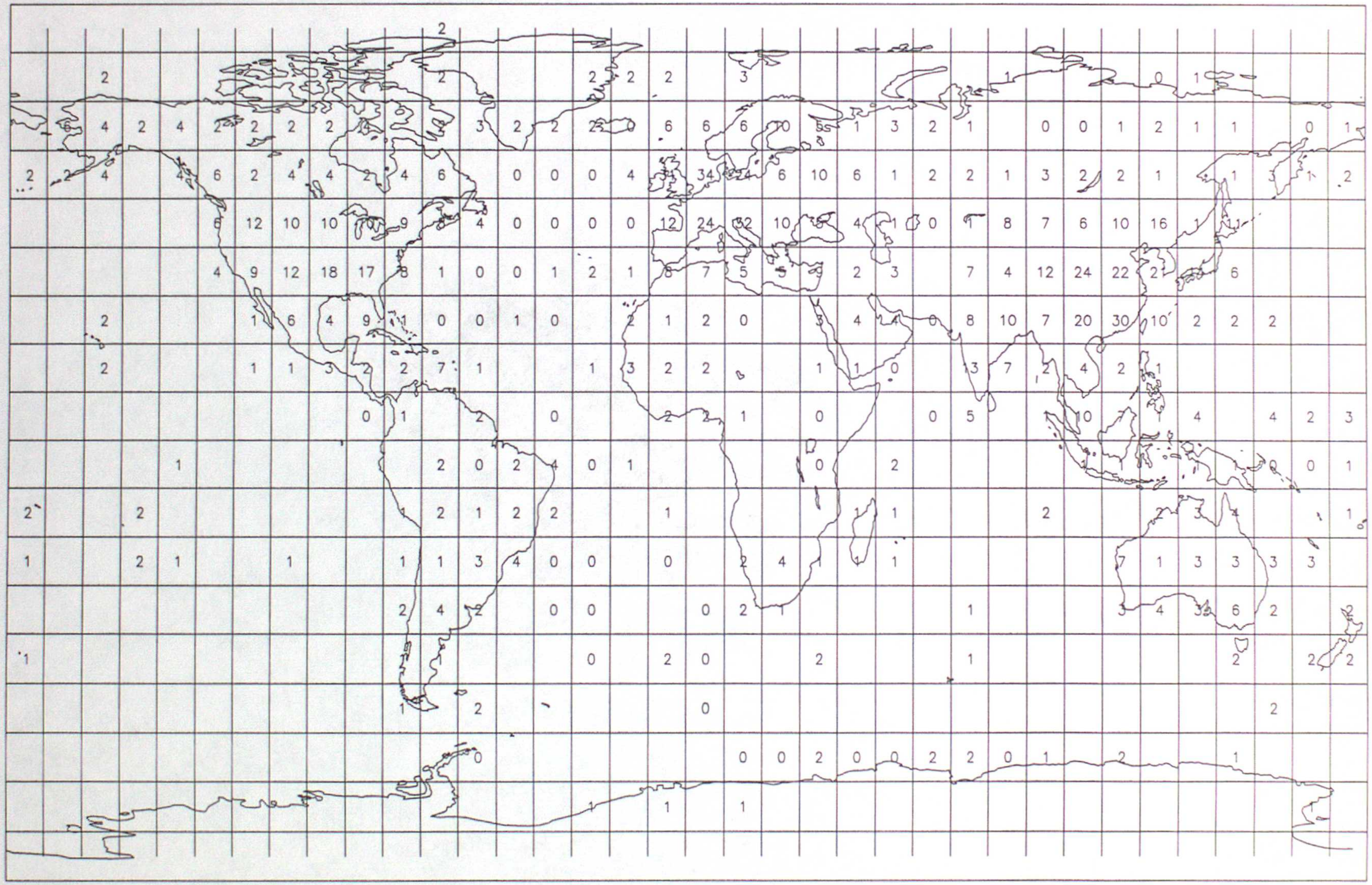
WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
42027	12	Z	100	34/ 75	10	2	100.3	121.5	157.6	6
42314	12	Z	200	27/ 95	14	0	46.9	-81.9	94.4	4
42369	00	Z	100	27/ 81	20	0	127.5	-19.6	129.0	5
42369	12	Z	400	27/ 81	19	1	64.8	-5.4	65.0	6
42647	12	Z	100	23/ 73	11	0	71.5	128.5	147.1	6
43003	12	Z	150	19/ 73	12	12	57.9	210.2	218.1	7
43285	12	Z	100	13/ 75	21	0	80.1	99.0	127.4	4
43295	00	Z	100	13/ 78	22	1	105.9	66.6	125.1	4
43369	12	Z	100	8/ 73	18	1	102.0	122.9	159.7	7
44212	00	Z	1000	50/ 92	15	9	24.5	54.2	59.5	6
53463	12	Z	200	41/ 112	24	0	81.4	55.0	98.2	4
56739	12	Z	1000	25/ 98	29	1	11.4	66.5	67.5	6
71082	12	Z	700	83/ -62	31	0	37.1	12.4	39.1	4
82824	12	Z	100	-9/ -64	27	0	27.2	126.2	129.1	5
84628	12	Z	850	-12/ -77	14	0	7.4	-69.9	70.3	6
89009	00	Z	1000	-90/ 0	1	22	0.0	47.0	47.0	5
91366	00	Z	100	9/ 168	27	0	85.8	171.3	191.6	4

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – MARCH 2000 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1107



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6 12 10 10 9 4 0 0 0 0 12 24 32 10 6 4 1 0 1 8 7 6 10 16 1 1
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2 4 2 0 0 0 2 1 1 3 4 32 6 2 2
1 1 0 2 0 2 1 2 2 2
1 2 0 2
0 0 0 2 0 0 2 2 0 1 2 1
1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

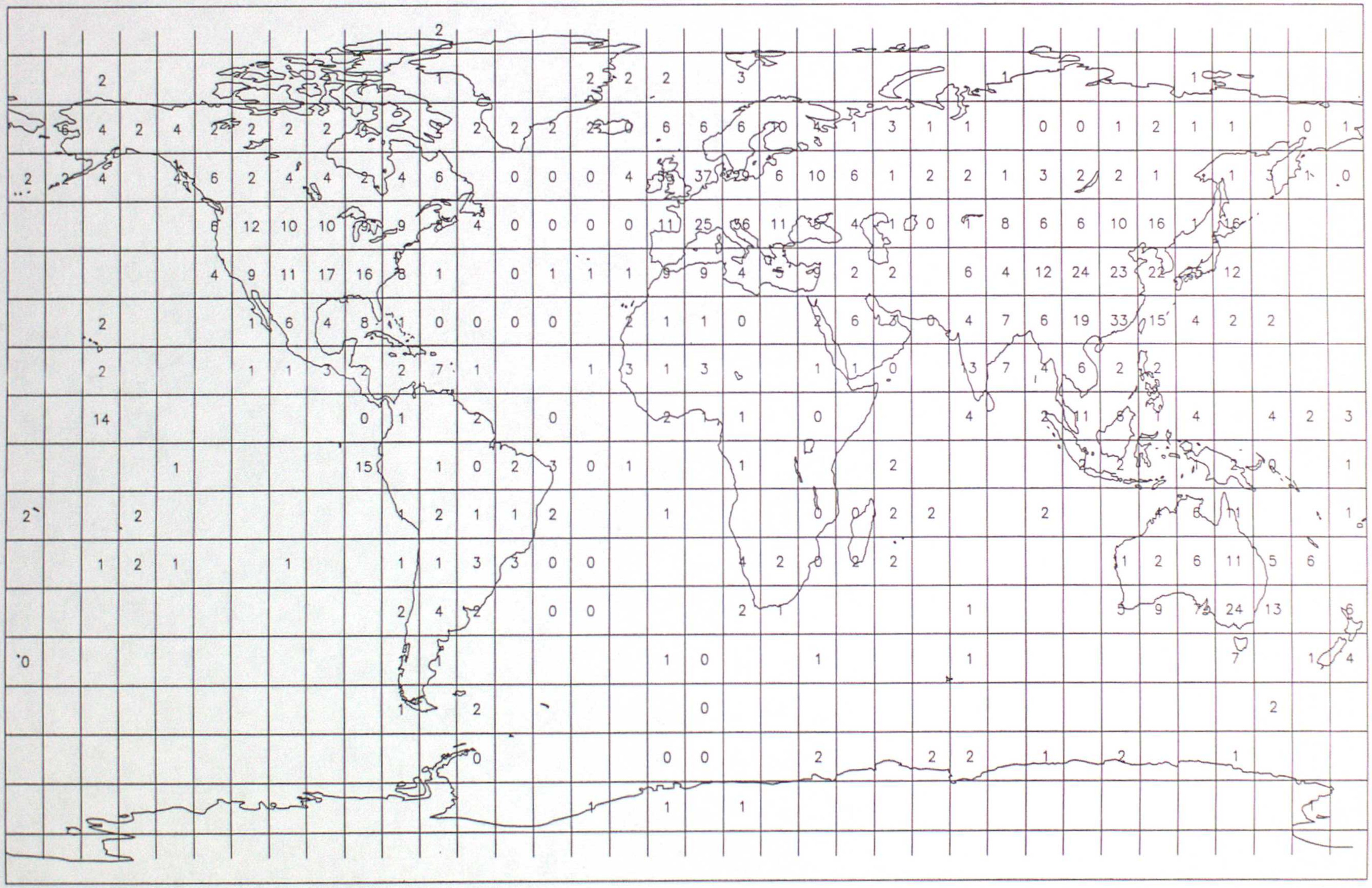
GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	12	V	100	-5/ -81	25	0	64	-2.0	-1.5	23.8	2
42369	00	V	300	27/ 81	24	0	95	-12.7	-0.3	20.9	1
42369	12	V	300	27/ 81	19	0	100	-11.3	-0.1	19.7	1
42397	00	V	250	27/ 88	18	0	100	-7.8	-5.4	22.2	3
42397	12	V	200	27/ 88	11	0	100	-11.4	-7.3	21.2	3
42410	12	V	300	26/ 92	12	0	100	-15.9	-1.1	26.9	1
42701	00	V	300	23/ 85	12	0	8	9.8	-0.8	17.4	1
44212	00	V	150	50/ 92	17	1	23	-0.1	-0.7	32.3	1
48855	00	V	150	16/ 108	31	0	58	-1.4	13.3	20.7	1
57993	12	V	150	26/ 115	31	0	22	13.6	8.8	23.1	2
60620	12	V	200	28/ 0	11	0	100	-25.8	-0.6	30.3	2
62420	00	V	500	28/ 29	13	0	23	-22.0	-3.0	25.6	1
78486	12	V	150	18/ -70	15	1	100	3.7	-6.3	28.6	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – MARCH 2000 FIGURE 9
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1270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6 4 2 4 2 2 2 2 2 2 2 23 6 6 6 10 5 1 3 1 1 0 0 1 2 1 1 0 1
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 39 37 29 6 10 6 1 2 2 1 3 2 2 1 1 3 1 0
6 12 10 10 9 4 0 0 0 0 11 25 36 11 6 4 1 0 1 8 6 6 10 16 1 16
4 9 11 17 16 8 1 0 1 1 1 9 9 4 5 9 2 2 6 4 12 24 23 22 5 12
2 1 6 4 8 1 0 0 0 0 2 1 1 0 2 6 3 0 4 7 6 19 33 15 4 2 2
2 1 1 3 2 2 7 1 1 3 1 3 1 1 0 13 7 4 6 2 2
14 0 1 2 0 2 1 0 4 2 11 8 1 4 4 2 3
1 15 1 0 2 3 0 1 1 2 2 2 0 1
2 2 1 2 1 1 2 1 0 0 2 2 2 6 1 1
1 2 1 1 1 1 3 3 0 0 4 2 0 2 2 1 2 6 11 5 6
2 4 2 0 0 2 1 1 5 9 7 24 13 6
0 1 1 1 0 1 1 7 1 4
1 2 0 2
0 0 0 2 2 2 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17240	00	DD	38/ 31	21	-10.6	7.4	13.1
17280	00	DD	38/ 40	28	-11.1	3.8	10.1
17351	00	DD	37/ 35	26	-17.8	1.2	13.3
31004	12	DD	59/ 125	15	-11.9	5.0	17.0
60571	12	DD	32/ -2	24	24.7	7.2	14.0
78866	12	DD	18/ -63	24	-11.0	3.9	9.8
78970	12	DD	11/ -61	22	18.6	7.6	28.1
98646	00	DD	10/ 124	17	13.5	7.1	24.6

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

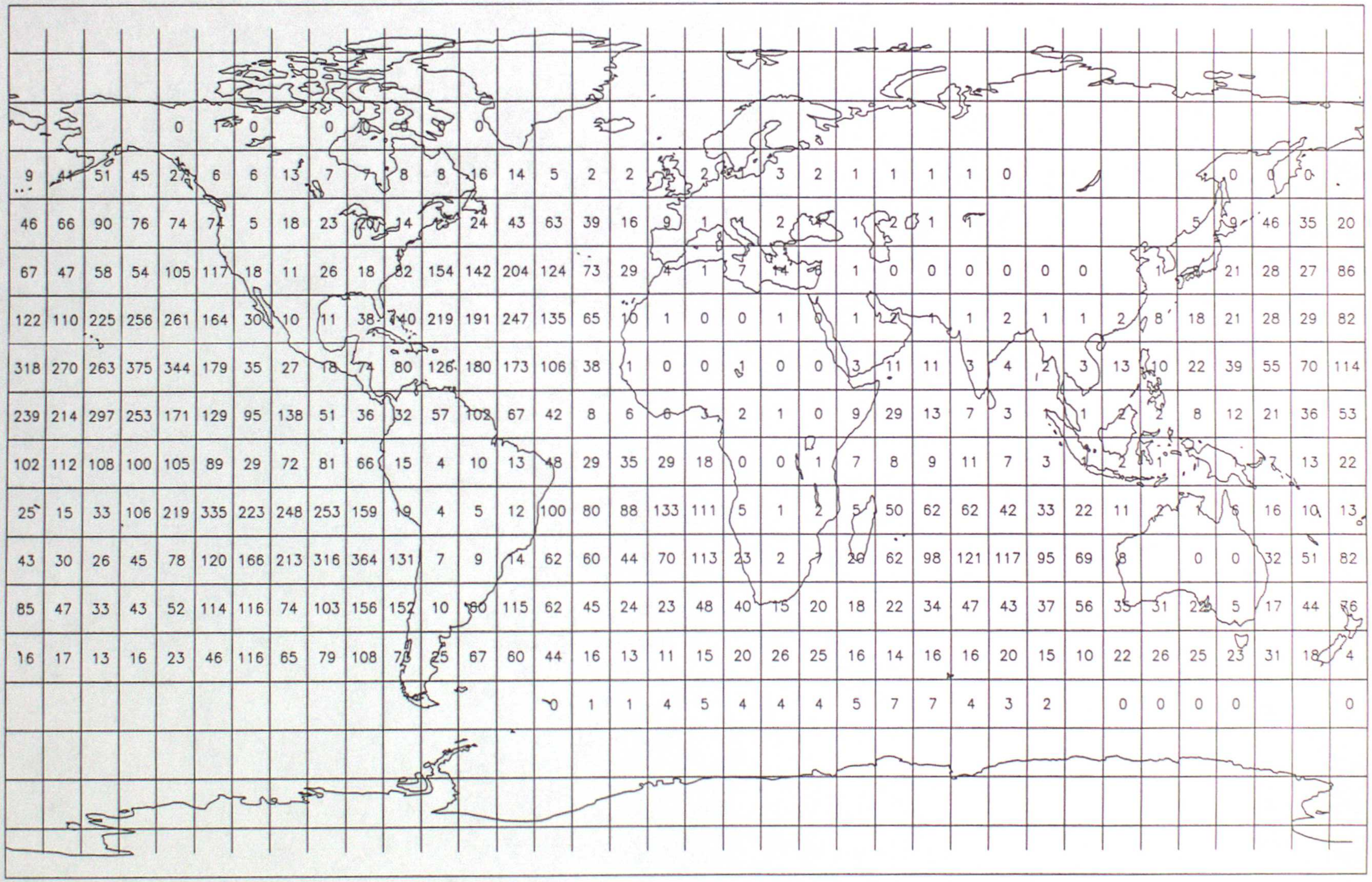
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
MARCH 2000



				0	1	0		0		0		0																							
9	41	51	45	27	6	6	13	7	7	8	8	16	14	5	2	2		2		3	2	1	1	1	1	0						0	0	0	
46	66	90	76	74	74	5	18	23	20	14	13	24	43	63	39	16	9	1	1	2	4	1	2	1	1						5	9	46	35	20
67	47	58	54	105	117	18	11	26	18	82	154	142	204	124	73	29	4	1	7	14	6	1	0	0	0	0	0	0		1	8	21	28	27	86
122	110	225	256	261	164	30	10	11	38	140	219	191	247	135	65	10	1	0	0	1	0	1	2	1	1	2	1	1	2	8	18	21	28	29	82
318	270	263	375	344	179	35	27	18	74	80	126	180	173	106	38	1	0	0	1	0	0	3	11	11	3	4	2	3	13	10	22	39	55	70	114
239	214	297	253	171	129	95	138	51	36	32	57	102	67	42	8	6	6	3	2	1	0	9	29	13	7	3	1	1	2	2	8	12	21	36	53
102	112	108	100	105	89	29	72	81	66	15	4	10	13	48	29	35	29	18	0	0	1	7	8	9	11	7	3	1	2	1	1	1	7	13	22
25	15	33	106	219	335	223	248	253	159	19	4	5	12	100	80	88	133	111	5	1	2	5	50	62	62	42	33	22	11	2	1	6	16	10	13
43	30	26	45	78	120	166	213	316	364	131	7	9	14	62	60	44	70	113	23	2	7	26	62	98	121	117	95	69	8		0	0	32	51	82
85	47	33	43	52	114	116	74	103	156	152	10	60	115	62	45	24	23	48	40	15	20	18	22	34	47	43	37	56	35	31	22	5	17	44	76
16	17	13	16	23	46	116	65	79	108	73	25	67	60	44	16	13	11	15	20	26	25	16	14	16	16	20	15	10	22	26	25	23	31	18	4
														0	1	1	4	5	4	4	4	5	7	7	4	3	2		0	0	0	0			0

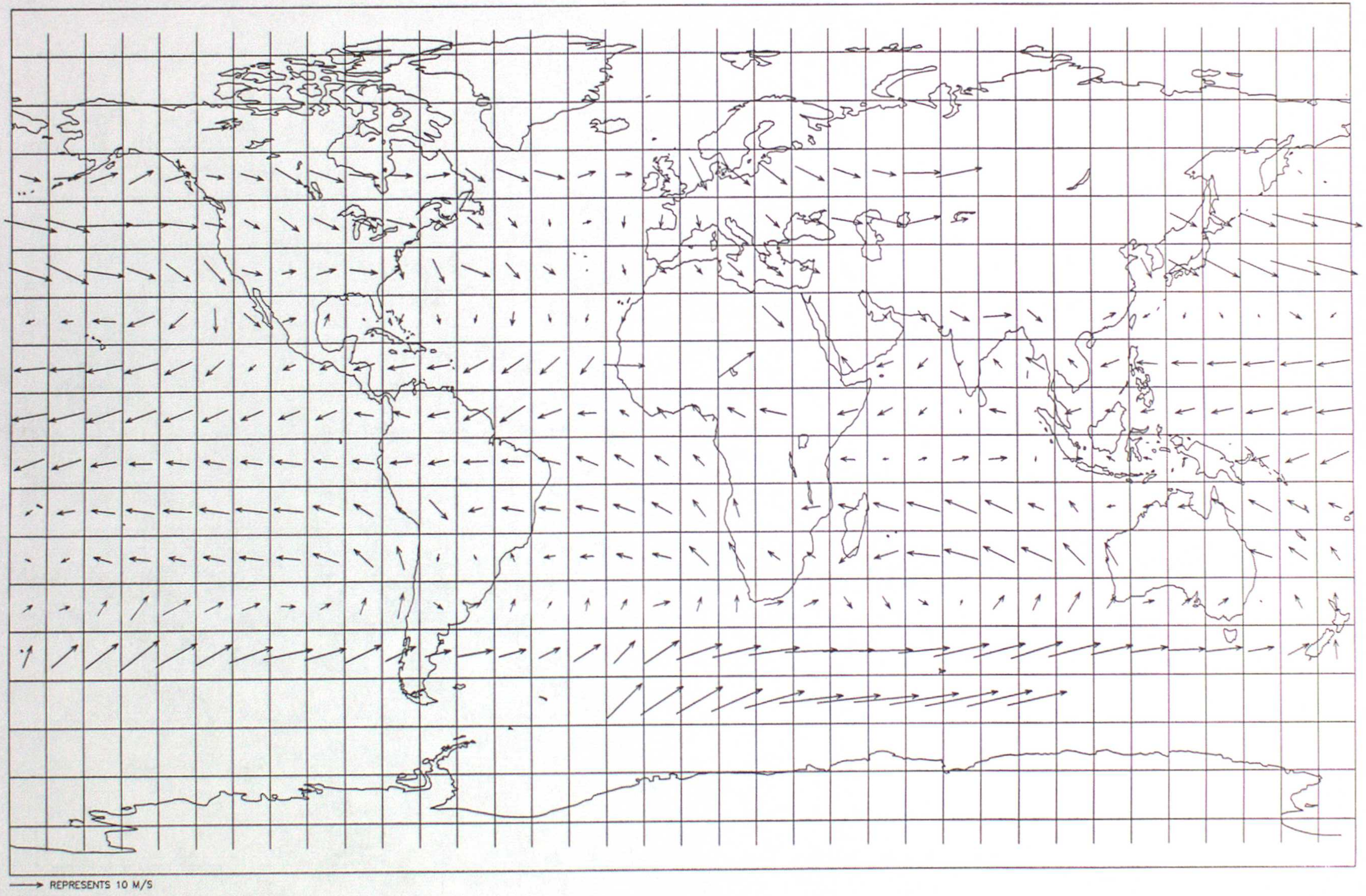
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

FIGURE 11

MARCH 2000

ALL OBSERVATIONS

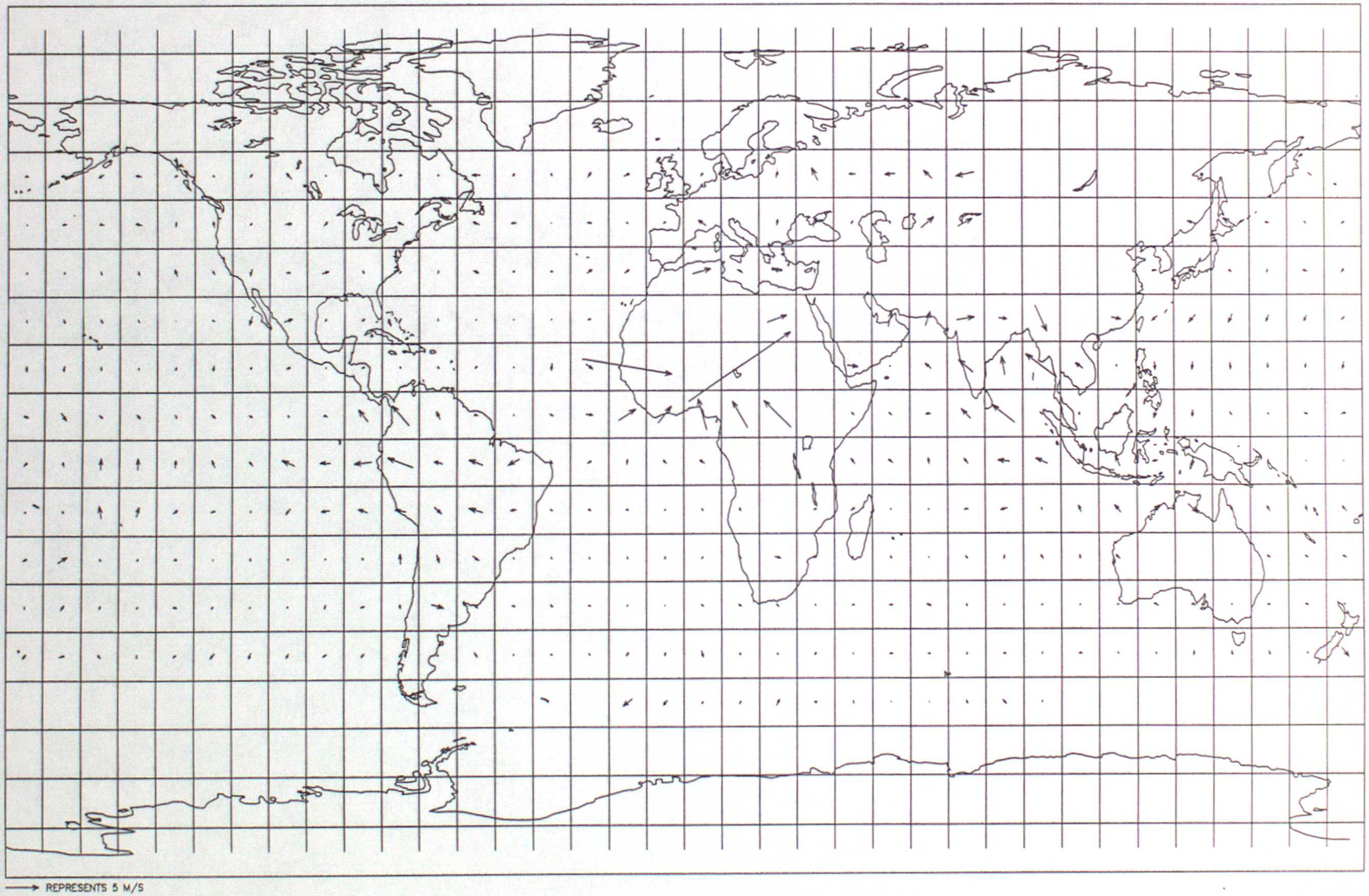
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

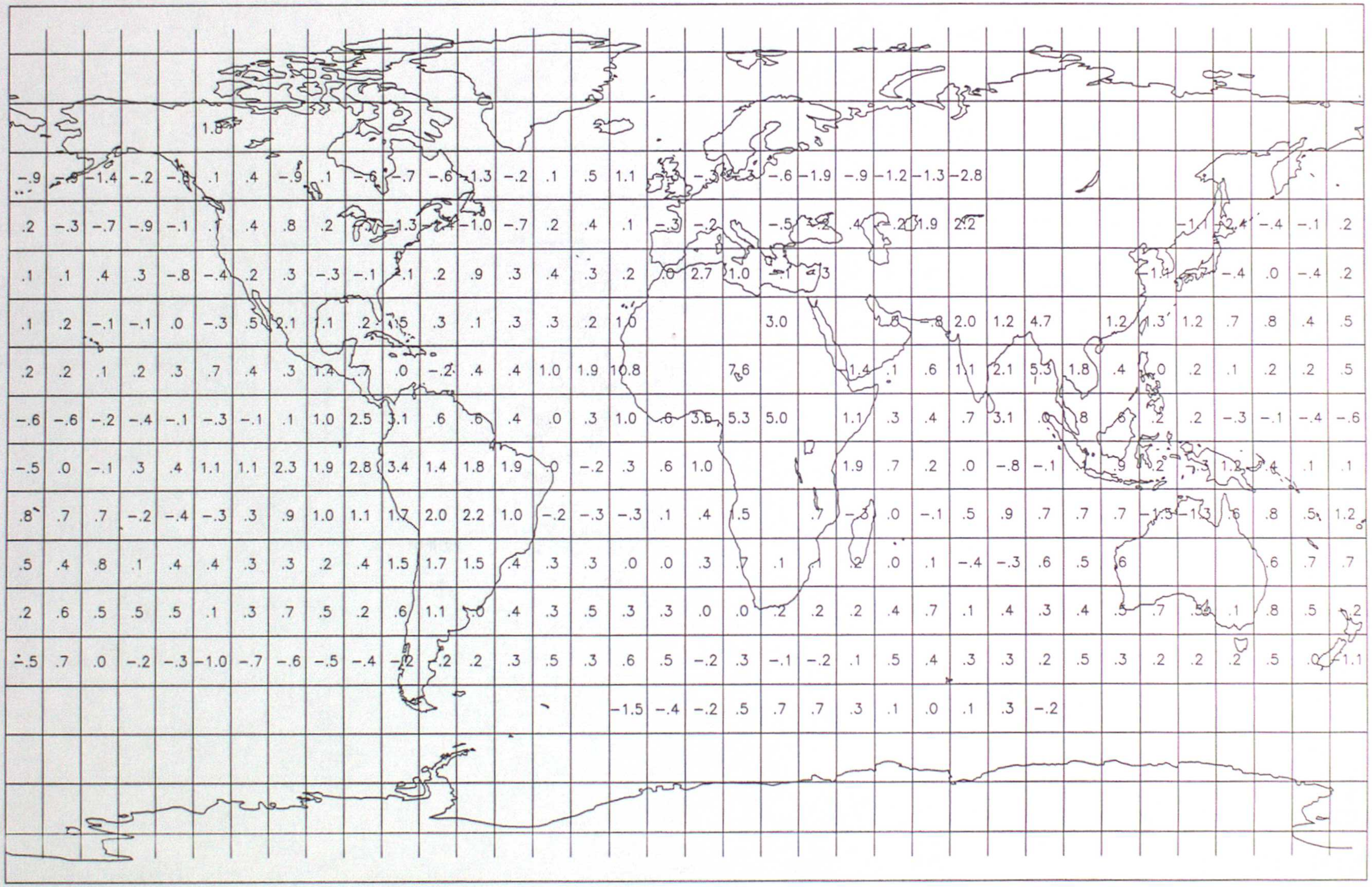
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

FIGURE 12

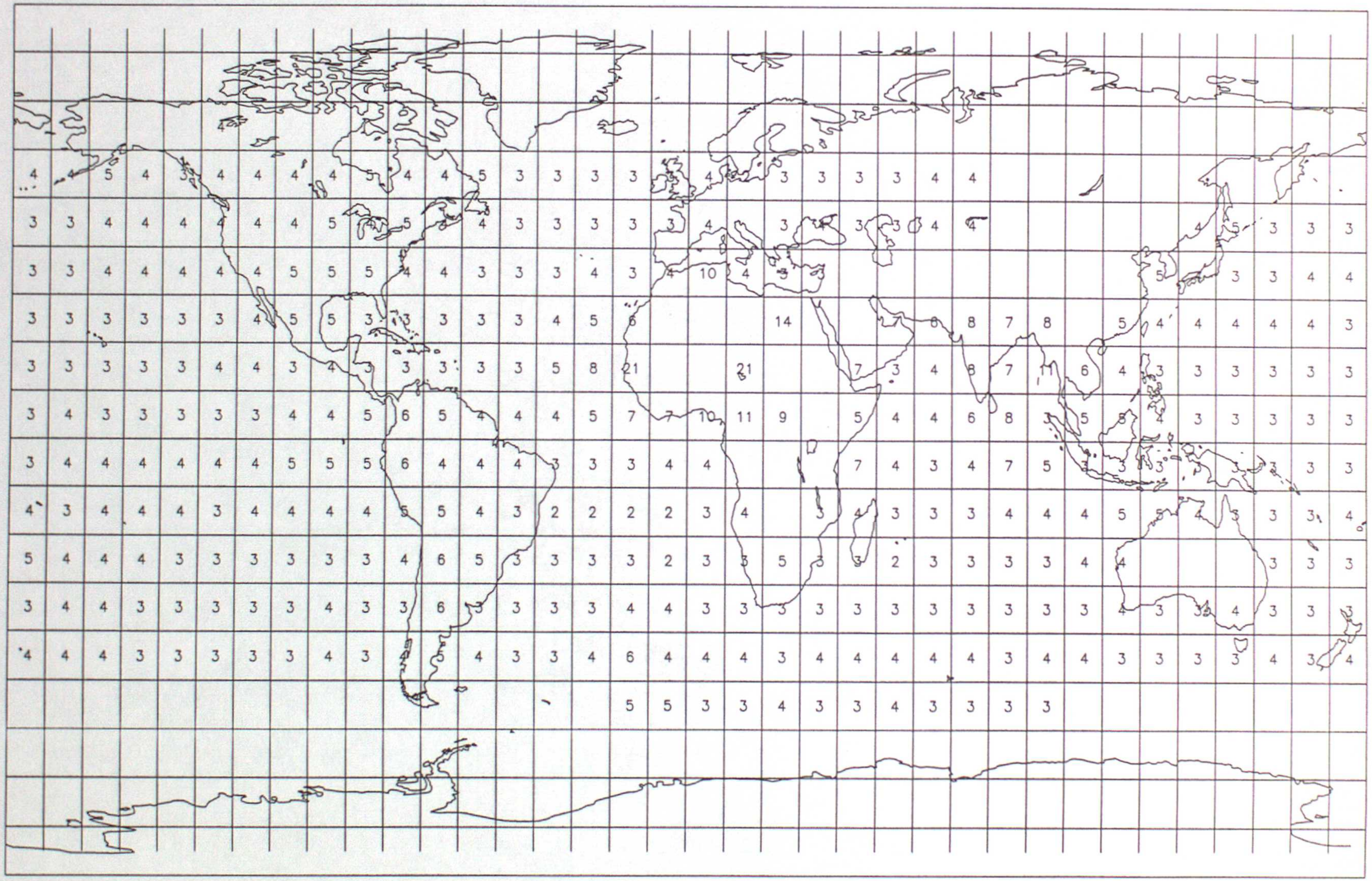
MARCH 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



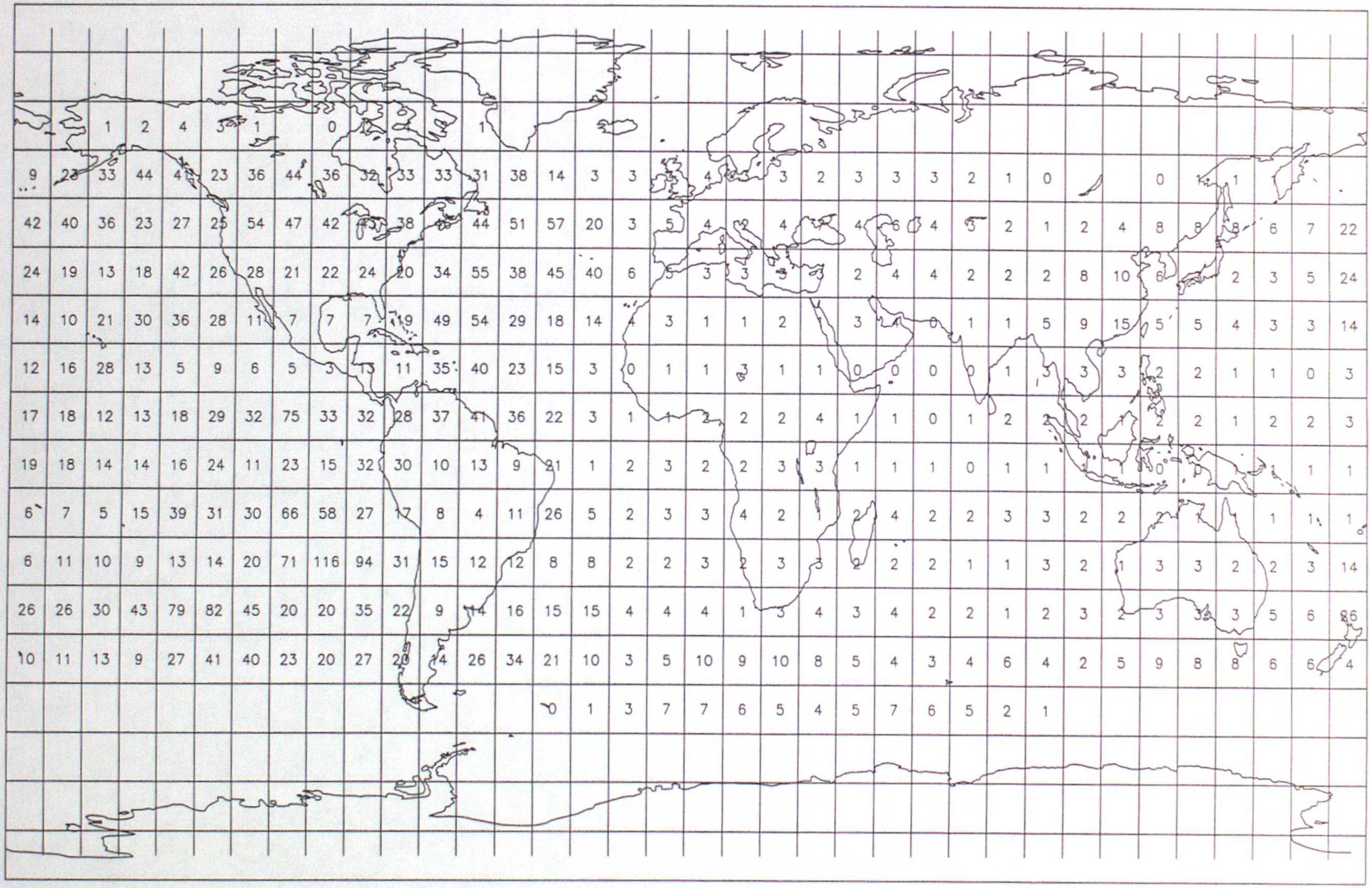
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


1.8
-.9 -.8 -1.4 -.2 -.8 .1 .4 -.9 .1 -.6 -.7 -.6 -1.3 -.2 .1 .5 1.1 -.3 -.3 -.3 -.6 -1.9 -.9 -1.2 -1.3 -2.8
.2 -.3 -.7 -.9 -.1 .1 .4 .8 .2 -.7 -1.3 -1.4 -1.0 -.7 .2 .4 .1 -.3 -.2 -.5 -.2 .4 -.2 1.9 2.2 -1.1 -2.4 -.4 -.1 .2
.1 .1 .4 .3 -.8 -.4 .2 .3 -.3 -.1 .1 .2 .9 .3 .4 .3 .2 .0 2.7 1.0 -.1 .3 -1.4 -.7 -.4 .0 -.4 .2
.1 .2 -.1 -.1 .0 -.3 .5 2.1 1.1 .2 1.5 .3 .1 .3 .3 .2 1.0 3.0 .8 -.8 2.0 1.2 4.7 1.2 1.3 1.2 .7 .8 .4 .5
.2 .2 .1 .2 .3 .7 .4 .3 1.4 .7 .0 -.2 .4 .4 1.0 1.9 10.8 7.6 1.4 .1 .6 1.1 2.1 5.3 1.8 .4 .0 .2 .1 .2 .2 .5
-.6 -.6 -.2 -.4 -.1 -.3 -.1 .1 1.0 2.5 3.1 .6 .6 .4 .0 .3 1.0 .6 3.5 5.3 5.0 1.1 .3 .4 .7 3.1 .0 .8 .6 .2 .2 -.3 -.1 -.4 -.6
-.5 .0 -.1 .3 .4 1.1 1.1 2.3 1.9 2.8 3.4 1.4 1.8 1.9 .0 -.2 .3 .6 1.0 1.9 .7 .2 .0 -.8 -.1 .1 .9 .2 .3 1.2 .4 .1 .1
.8 .7 .7 -.2 -.4 -.3 .3 .9 1.0 1.1 1.7 2.0 2.2 1.0 -.2 -.3 -.3 .1 .4 .5 .7 -.3 .0 -.1 .5 .9 .7 .7 .7 -1.5 -1.3 .6 .8 .5 1.2
.5 .4 .8 .1 .4 .4 .3 .3 .2 .4 1.5 1.7 1.5 .4 .3 .3 .0 .0 .3 .7 .1 .1 .2 .0 .1 -.4 -.3 .6 .5 .6 .6 .7 .7
.2 .6 .5 .5 .5 .1 .3 .7 .5 .2 .6 1.1 .0 .4 .3 .5 .3 .3 .0 .0 .2 .2 .2 .4 .7 .1 .4 .3 .4 .5 .7 .5 .1 .8 .5 .2
.5 .7 .0 -.2 -.3 -1.0 -.7 -.6 -.5 -.4 -.2 .2 .2 .3 .5 .3 .6 .5 -.2 .3 -.1 -.2 .1 .5 .4 .3 .3 .2 .5 .3 .2 .2 .2 .5 .0 -1.1
-1.5 -.4 -.2 .5 .7 .7 .3 .1 .0 .1 .3 -.2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4
4 4 5 4 3 4 4 4 4 5 4 4 5 3 3 3 3 3 4 3 3 3 3 4 4
3 3 4 4 4 4 4 4 5 4 5 3 4 3 3 3 3 3 4 3 4 3 3 4 4 4 5 3 3 3
3 3 4 4 4 4 4 5 5 5 4 4 3 3 3 4 3 4 10 4 3 3 5 3 3 4 4
3 3 3 3 3 3 4 5 5 3 3 3 3 3 4 5 6 14 7 6 8 7 8 5 4 4 4 4 4 3
3 3 3 3 3 4 4 3 4 3 3 3 3 3 5 8 21 21 7 3 4 8 7 11 6 4 3 3 3 3 3 3
3 4 3 3 3 3 3 4 4 5 6 5 4 4 4 5 7 7 10 11 9 5 4 4 6 8 3 5 8 4 3 3 3 3 3
3 4 4 4 4 4 4 5 5 5 6 4 4 4 3 3 3 4 4 7 4 3 4 7 5 3 3 3 3 3 3 3 3
4 3 4 4 4 3 4 4 4 4 5 5 4 3 2 2 2 2 3 4 3 4 3 3 3 4 4 4 5 5 4 3 3 3 4
5 4 4 4 3 3 3 3 3 3 4 6 5 3 3 3 3 2 3 3 5 3 3 2 3 3 3 3 4 4 3 3 3
3 4 4 3 3 3 3 3 4 3 3 6 3 3 3 3 4 4 3 3 3 3 3 3 3 3 3 3 3 4 3 3 4 3 3 3
4 4 4 3 3 3 3 3 4 3 4 5 4 3 3 4 6 4 4 4 3 4 4 4 4 4 3 4 4 3 3 3 3 4 3 4
5 5 3 3 4 3 3 4 3 3 3 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
MARCH 2000


1 2 4 3 1 0 1
9 23 33 44 41 23 36 44 36 32 33 33 31 38 14 3 3 3 4 3 3 2 3 3 3 2 1 0 0 1 1
42 40 36 23 27 25 54 47 42 43 38 46 44 51 57 20 3 5 4 2 4 7 4 6 4 3 2 1 2 4 8 8 8 6 7 22
24 19 13 18 42 26 28 21 22 24 20 34 55 38 45 40 6 5 3 3 5 3 2 4 4 2 2 2 8 10 6 2 3 5 24
14 10 21 30 36 28 11 7 7 7 19 49 54 29 18 14 4 3 1 1 2 1 3 4 0 1 1 5 9 15 5 5 4 3 3 14
12 16 28 13 5 9 6 5 3 13 11 35 40 23 15 3 0 1 1 3 1 1 0 0 0 0 1 3 3 3 2 2 1 1 0 3
17 18 12 13 18 29 32 75 33 32 28 37 41 36 22 3 1 1 2 2 2 4 1 1 0 1 2 2 2 1 2 2 1 2 2 3
19 18 14 14 16 24 11 23 15 32 30 10 13 9 21 1 2 3 2 2 3 3 1 1 1 0 1 1 1 1 0 0 1 1 1 1
6 7 5 15 39 31 30 66 58 27 17 8 4 11 26 5 2 3 3 4 2 1 2 4 2 2 3 3 2 2 2 1 1 1 1 1
6 11 10 9 13 14 20 71 116 94 31 15 12 12 8 8 2 2 3 2 3 3 2 2 2 1 1 3 2 1 3 3 2 2 3 14
26 26 30 43 79 82 45 20 20 35 22 9 14 16 15 15 4 4 4 1 3 4 3 4 2 2 1 2 3 2 3 33 3 5 6 86
10 11 13 9 27 41 40 23 20 27 20 14 26 34 21 10 3 5 10 9 10 8 5 4 3 4 6 4 2 5 9 8 8 6 6 4
0 1 3 7 7 6 5 4 5 7 6 5 2 1

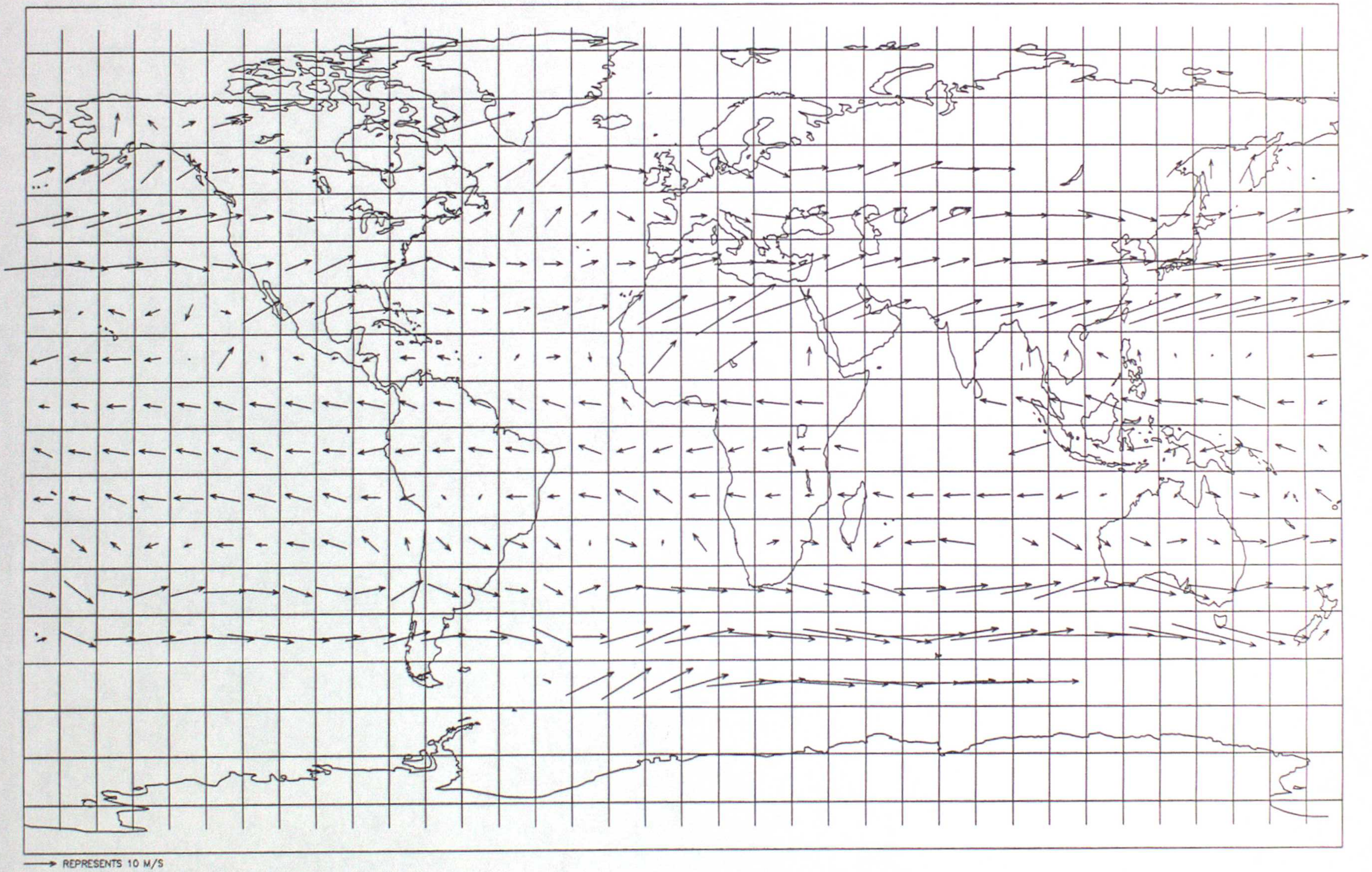
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA

MARCH 2000

ALL OBSERVATIONS

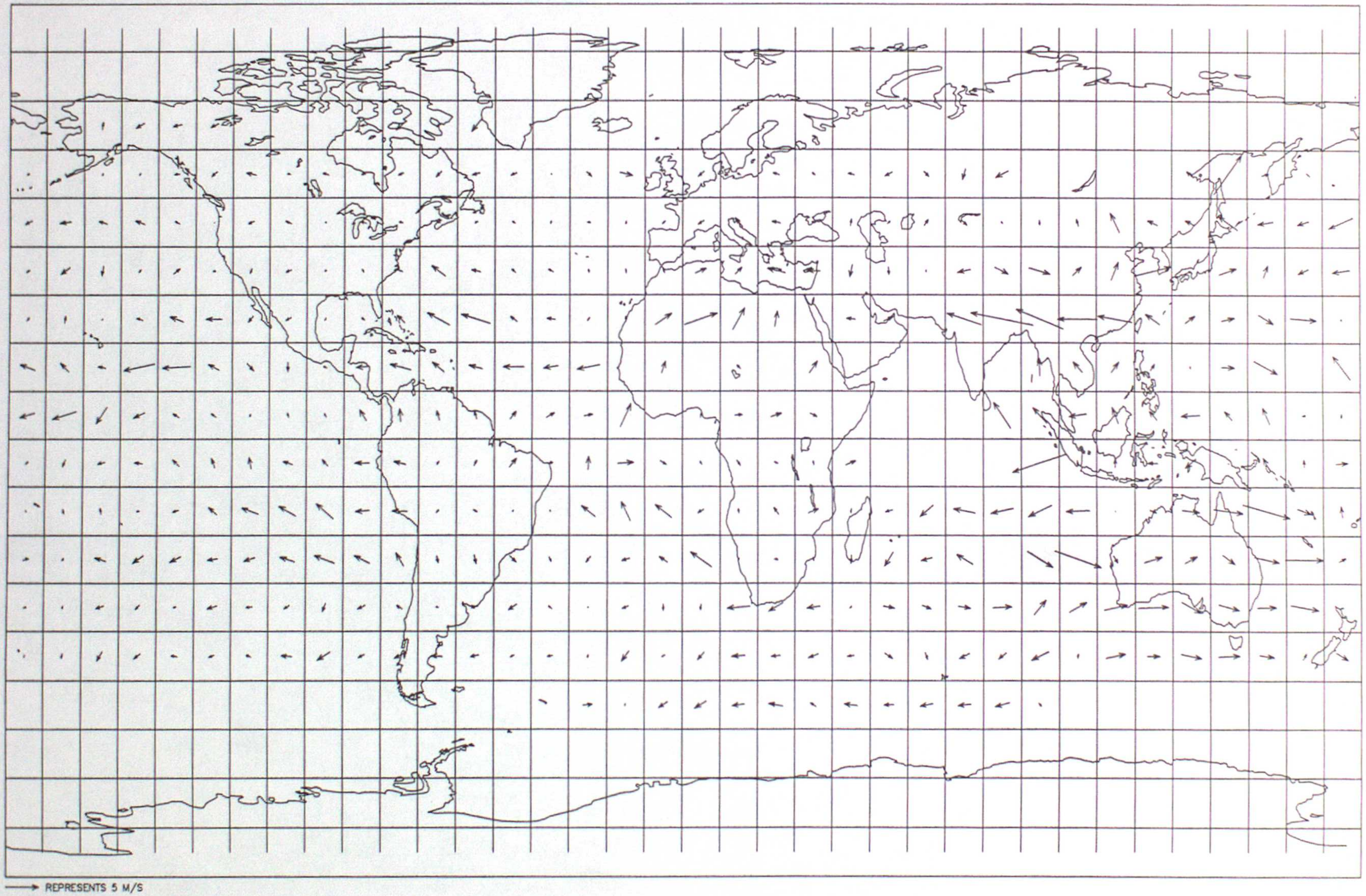
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

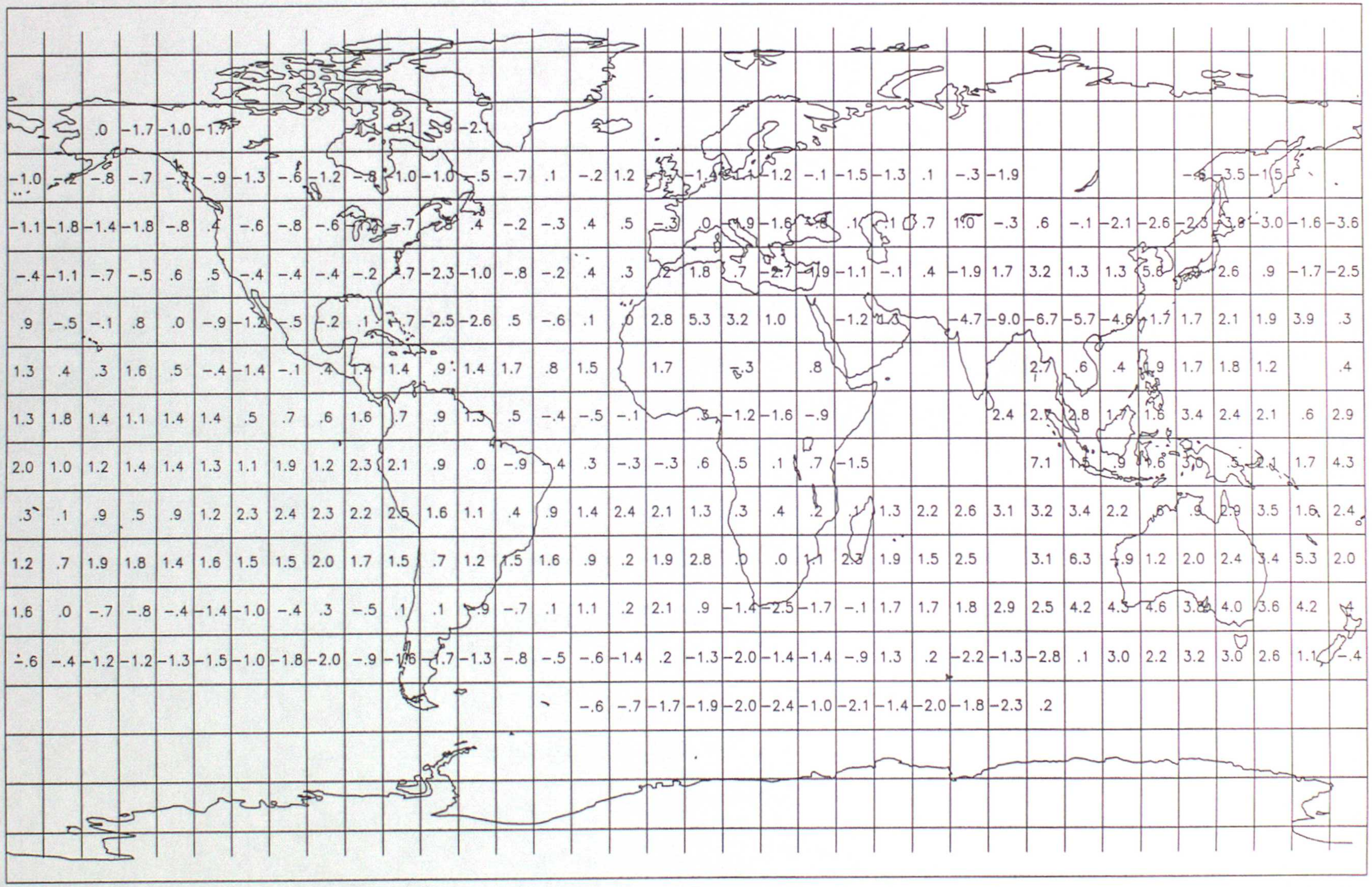

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401–700 HPA
MARCH 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

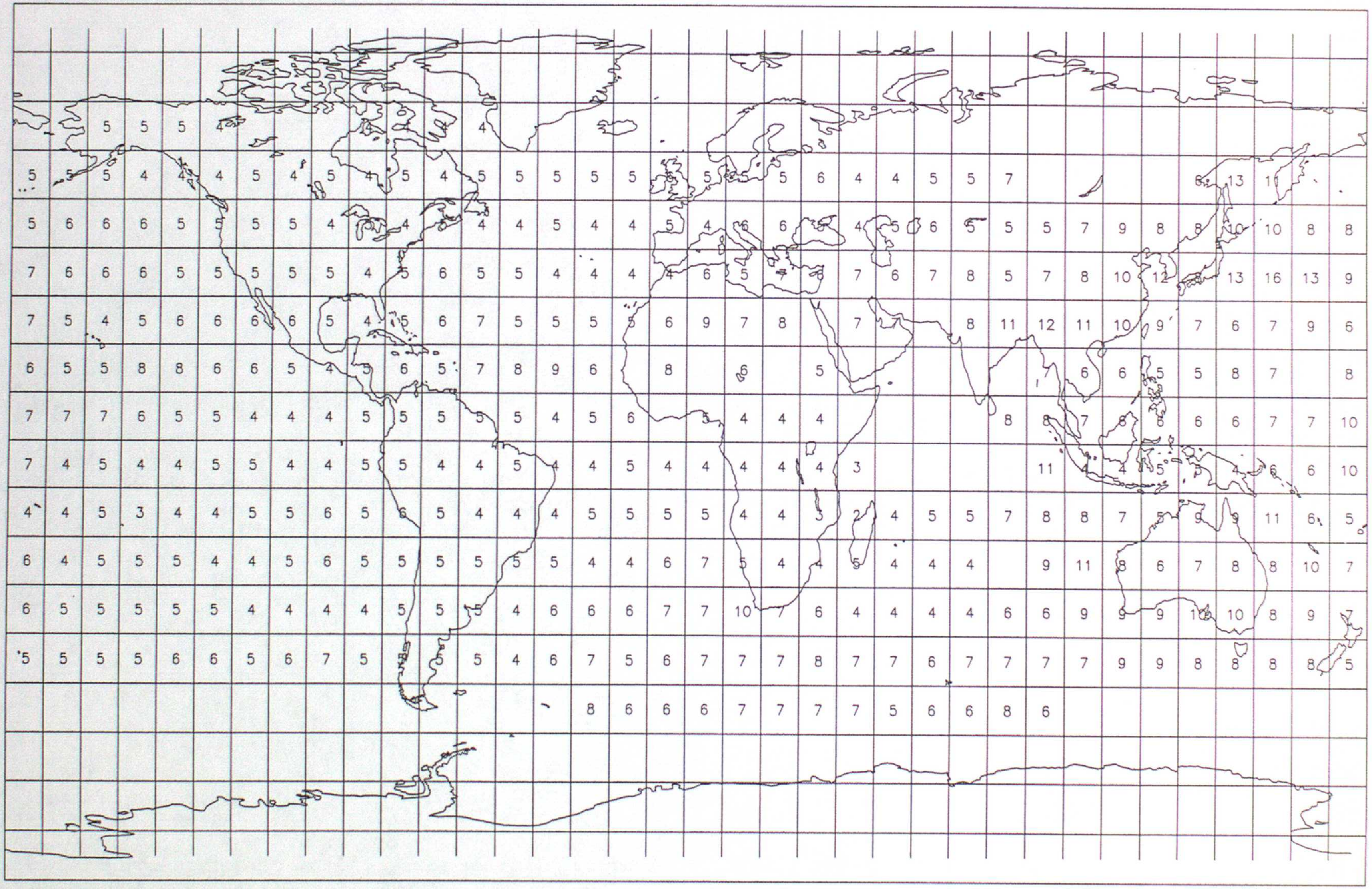
FIGURE 17


REPRESENTS 5 M/S

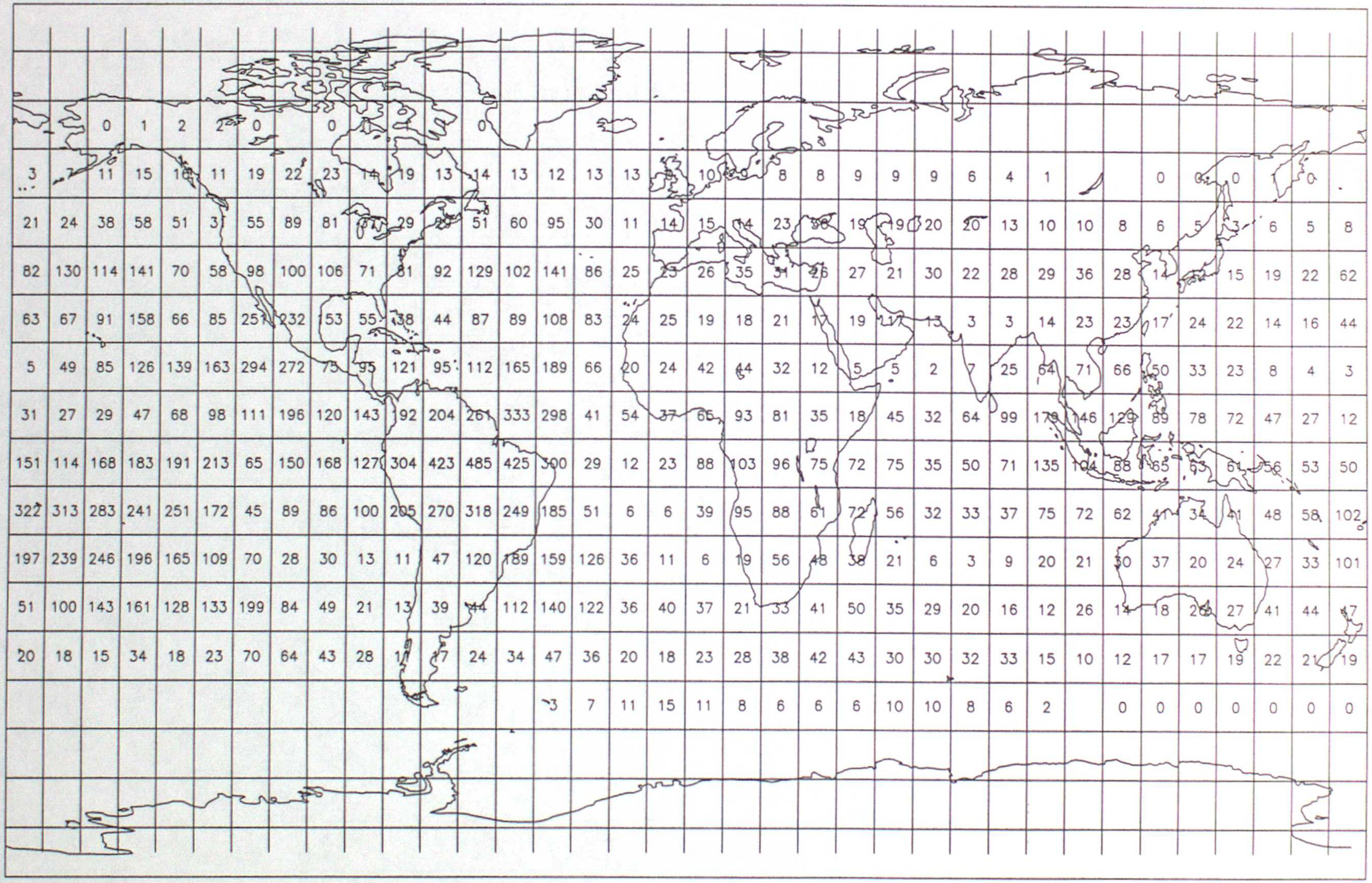
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.0 -1.7 -1.0 -1.7 -1.1 -1.1 -.9 -2.
-1.0 -.2 -.8 -.7 -.7 -.9 -1.3 -.6 -1.2 -.8 -1.0 -1.0 -.5 -.7 .1 -.2 1.2 -1.1 -1.4 -1.1 -1.2 -.1 -1.5 -1.3 .1 -.3 -1.9 -.6 -3.5 -1.5
-1.1 -1.8 -1.4 -1.8 -.8 .4 -.6 -.8 -.6 -1.2 -.7 -.8 .4 -.2 -.3 .4 .5 -.3 .0 -1.9 -1.6 -1.8 .1 -.1 .7 1.0 -.3 .6 -.1 -2.1 -2.6 -2.3 -3.8 -3.0 -1.6 -3.6
-.4 -1.1 -.7 -.5 .6 .5 -.4 -.4 -.4 -.2 -.7 -2.3 -1.0 -.8 -.2 .4 .3 .2 1.8 .7 -2.7 -1.9 -1.1 -.1 .4 -1.9 1.7 3.2 1.3 1.3 5.6 2.6 .9 -1.7 -2.5
.9 -.5 -.1 .8 .0 -.9 -1.2 -.5 -.2 .1 -.7 -2.5 -2.6 .5 -.6 .1 .0 2.8 5.3 3.2 1.0 -1.2 -1.3 -4.7 -9.0 -6.7 -5.7 -4.6 -1.7 1.7 2.1 1.9 3.9 .3
1.3 .4 .3 1.6 .5 -.4 -1.4 -.1 .4 1.4 1.4 .9 1.4 1.7 .8 1.5 1.7 .3 .8 2.7 .6 .4 1.9 1.7 1.8 1.2 .4
1.3 1.8 1.4 1.1 1.4 1.4 .5 .7 .6 1.6 .7 .9 1.3 .5 -.4 -.5 -.1 .3 -1.2 -1.6 -.9 2.4 2.7 2.8 1.7 1.6 3.4 2.4 2.1 .6 2.9
2.0 1.0 1.2 1.4 1.4 1.3 1.1 1.9 1.2 2.3 2.1 .9 .0 -.9 .4 .3 -.3 -.3 .6 .5 .1 .7 -1.5 7.1 1.5 .9 1.6 3.0 .5 2.1 1.7 4.3
.3 .1 .9 .5 .9 1.2 2.3 2.4 2.3 2.2 2.5 1.6 1.1 .4 .9 1.4 2.4 2.1 1.3 .3 .4 .2 .1 1.3 2.2 2.6 3.1 3.2 3.4 2.2 .6 .9 2.9 3.5 1.6 2.4
1.2 .7 1.9 1.8 1.4 1.6 1.5 1.5 2.0 1.7 1.5 .7 1.2 1.5 1.6 .9 .2 1.9 2.8 .0 .0 1.1 2.3 1.9 1.5 2.5 3.1 6.3 -.9 1.2 2.0 2.4 3.4 5.3 2.0
1.6 .0 -.7 -.8 -.4 -1.4 -1.0 -.4 .3 -.5 .1 .1 -.9 -.7 .1 1.1 .2 2.1 .9 -1.4 -2.5 -1.7 -.1 1.7 1.7 1.8 2.9 2.5 4.2 4.3 4.6 3.8 4.0 3.6 4.2 .4
-.6 -.4 -1.2 -1.2 -1.3 -1.5 -1.0 -1.8 -2.0 -.9 -1.6 -1.7 -1.3 -.8 -.5 -.6 -1.4 .2 -1.3 -2.0 -1.4 -1.4 -.9 1.3 .2 -2.2 -1.3 -2.8 .1 3.0 2.2 3.2 3.0 2.6 1.1 -.4
-.6 -.7 -1.7 -1.9 -2.0 -2.4 -1.0 -2.1 -1.4 -2.0 -1.8 -2.3 .2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

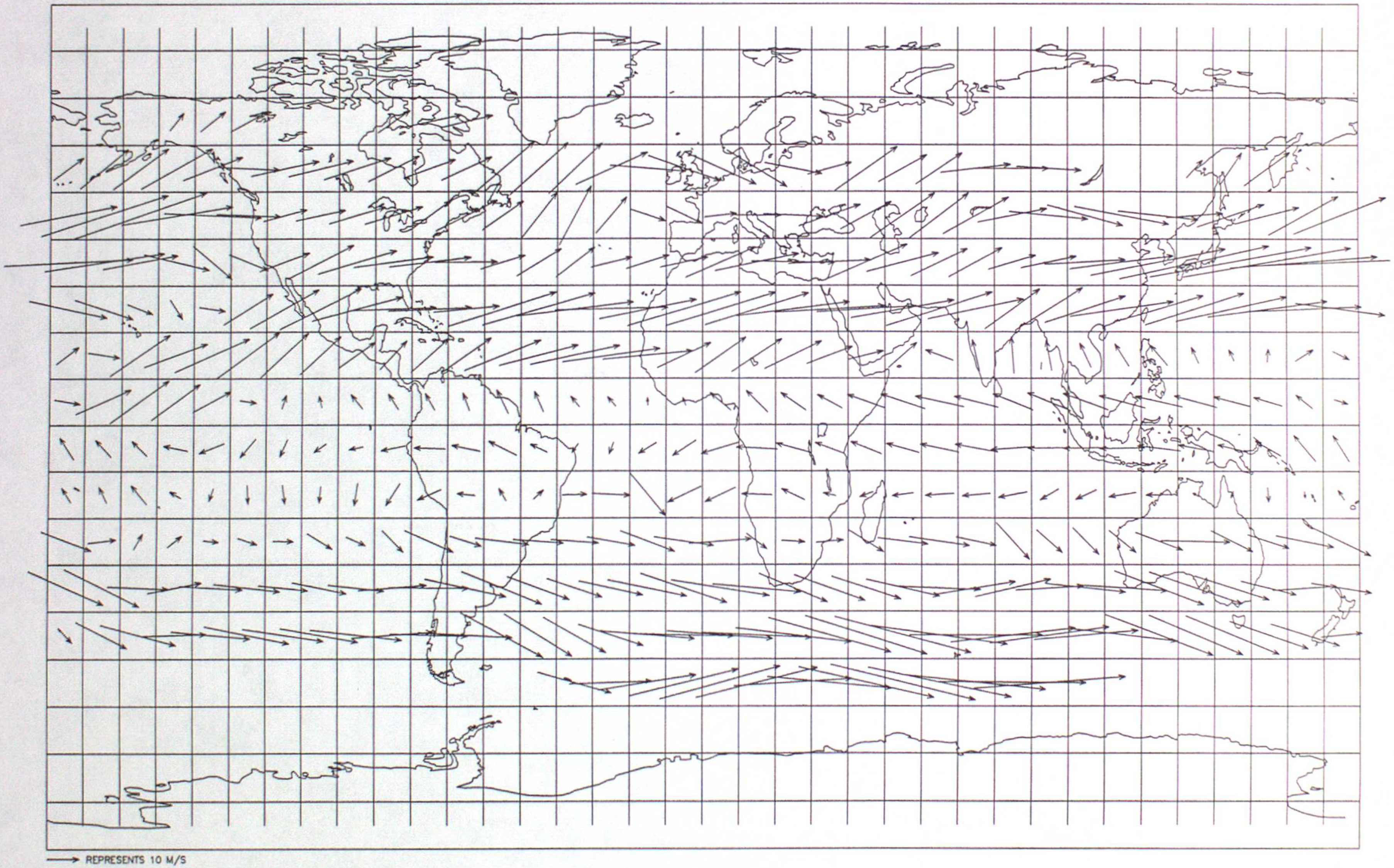

5 5 5 4 4
5 5 5 4 4 4 5 4 5 4 5 4 5 5 5 5 5 5 5 6 4 4 5 5 7 6 13 1
5 6 6 6 5 5 5 5 4 4 4 4 4 5 4 4 5 4 6 6 5 4 5 6 5 5 5 7 9 8 8 10 10 8 8
7 6 6 6 5 5 5 5 5 4 5 6 5 5 4 4 4 4 6 5 7 8 7 6 7 8 5 7 8 10 12 13 16 13 9
7 5 4 5 6 6 6 6 5 4 5 6 7 5 5 5 5 6 9 7 8 7 8 11 12 11 10 9 7 6 7 9 6
6 5 5 8 8 6 6 5 4 5 6 5 7 8 9 6 8 6 5 6 6 5 5 8 7 8
7 7 7 6 5 5 4 4 4 5 5 5 5 5 4 5 6 5 4 4 4 8 8 7 8 6 6 6 7 7 10
7 4 5 4 4 5 5 4 4 5 5 4 4 5 4 4 5 4 4 4 4 4 3 11 4 4 5 5 4 6 6 10
4 4 5 3 4 4 5 5 6 5 6 5 4 4 4 5 5 5 5 4 4 3 2 4 5 5 7 8 8 7 5 9 9 11 6 5
6 4 5 5 5 4 4 5 6 5 5 5 5 5 5 4 4 6 7 5 4 4 5 4 4 4 9 11 8 6 7 8 8 10 7
6 5 5 5 5 5 4 4 4 4 5 5 5 4 6 6 6 7 7 10 7 6 4 4 4 4 6 6 9 9 9 10 10 8 9 7
5 5 5 5 6 6 5 6 7 5 5 5 4 6 7 5 6 7 7 7 8 7 7 6 7 7 7 9 9 8 8 8 8 5
8 6 6 6 7 7 7 7 5 6 6 8 6

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
MARCH 2000



		0	1	2	2	0		0				0																							
3	7	11	15	16	11	19	22	23	14	19	13	14	13	12	13	13	9	10	9	8	8	9	9	9	6	4	1			0	0	0		0	
21	24	38	58	51	31	55	89	81	37	29	29	51	60	95	30	11	14	15	14	23	36	19	19	20	20	13	10	10	8	6	5	3	6	5	8
82	130	114	141	70	58	98	100	106	71	81	92	129	102	141	86	25	23	26	35	31	26	27	21	30	22	28	29	36	28	14	12	15	19	22	62
63	67	91	158	66	85	251	232	153	55	38	44	87	89	108	83	24	25	19	18	21	17	19	17	13	3	3	14	23	23	17	24	22	14	16	44
5	49	85	126	139	163	294	272	75	95	121	95	112	165	189	66	20	24	42	44	32	12	5	5	2	7	25	64	71	66	50	33	23	8	4	3
31	27	29	47	68	98	111	196	120	143	192	204	261	333	298	41	54	37	65	93	81	35	18	45	32	64	99	179	146	129	89	78	72	47	27	12
151	114	168	183	191	213	65	150	168	127	304	423	485	425	300	29	12	23	88	103	96	75	72	75	35	50	71	135	104	88	65	53	61	56	53	50
322	313	283	241	251	172	45	89	86	100	205	270	318	249	185	51	6	6	39	95	88	61	72	56	32	33	37	75	72	62	41	34	41	48	58	102
197	239	246	196	165	109	70	28	30	13	11	47	120	189	159	126	36	11	6	19	56	48	38	21	6	3	9	20	21	30	37	20	24	27	33	101
51	100	143	161	128	133	199	84	49	21	13	39	44	112	140	122	36	40	37	21	33	41	50	35	29	20	16	12	26	14	18	26	27	41	44	47
20	18	15	34	18	23	70	64	43	28	11	17	24	34	47	36	20	18	23	28	38	42	43	30	30	32	33	15	10	12	17	17	19	22	21	19
														3	7	11	15	11	8	6	6	6	10	10	8	6	2		0	0	0	0	0	0	0

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA FIGURE 21
MARCH 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

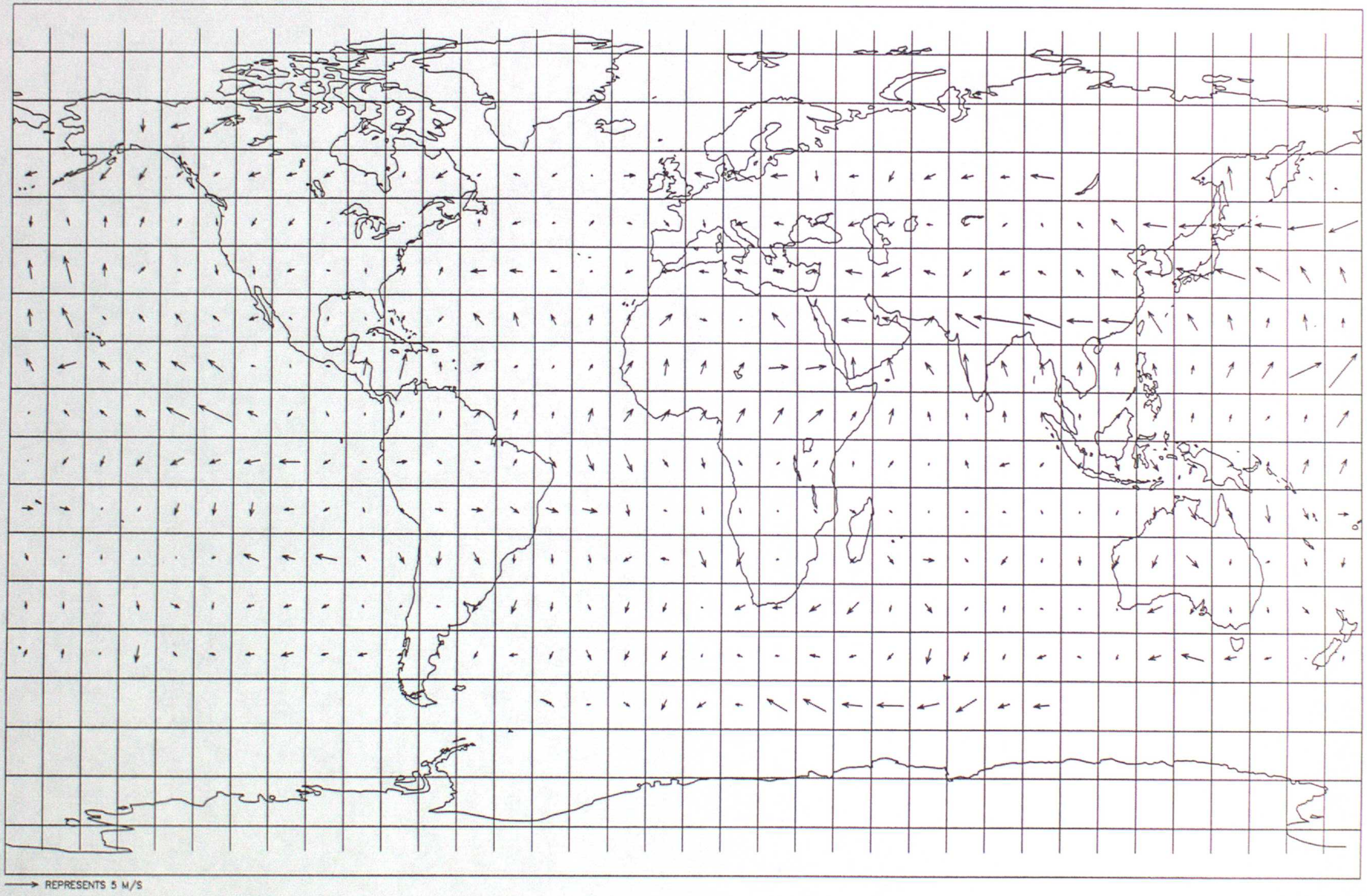
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA

MARCH 2000

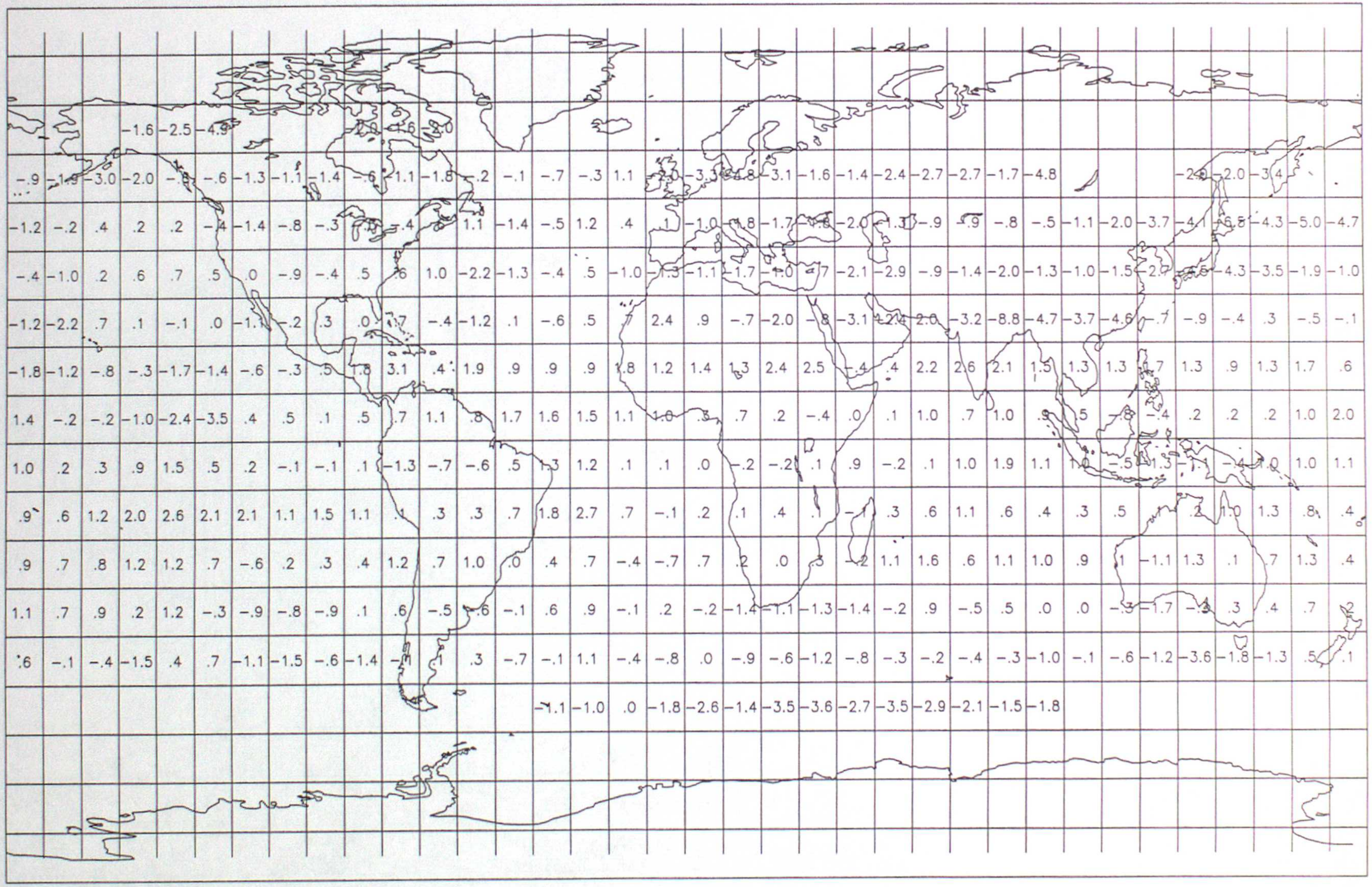
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

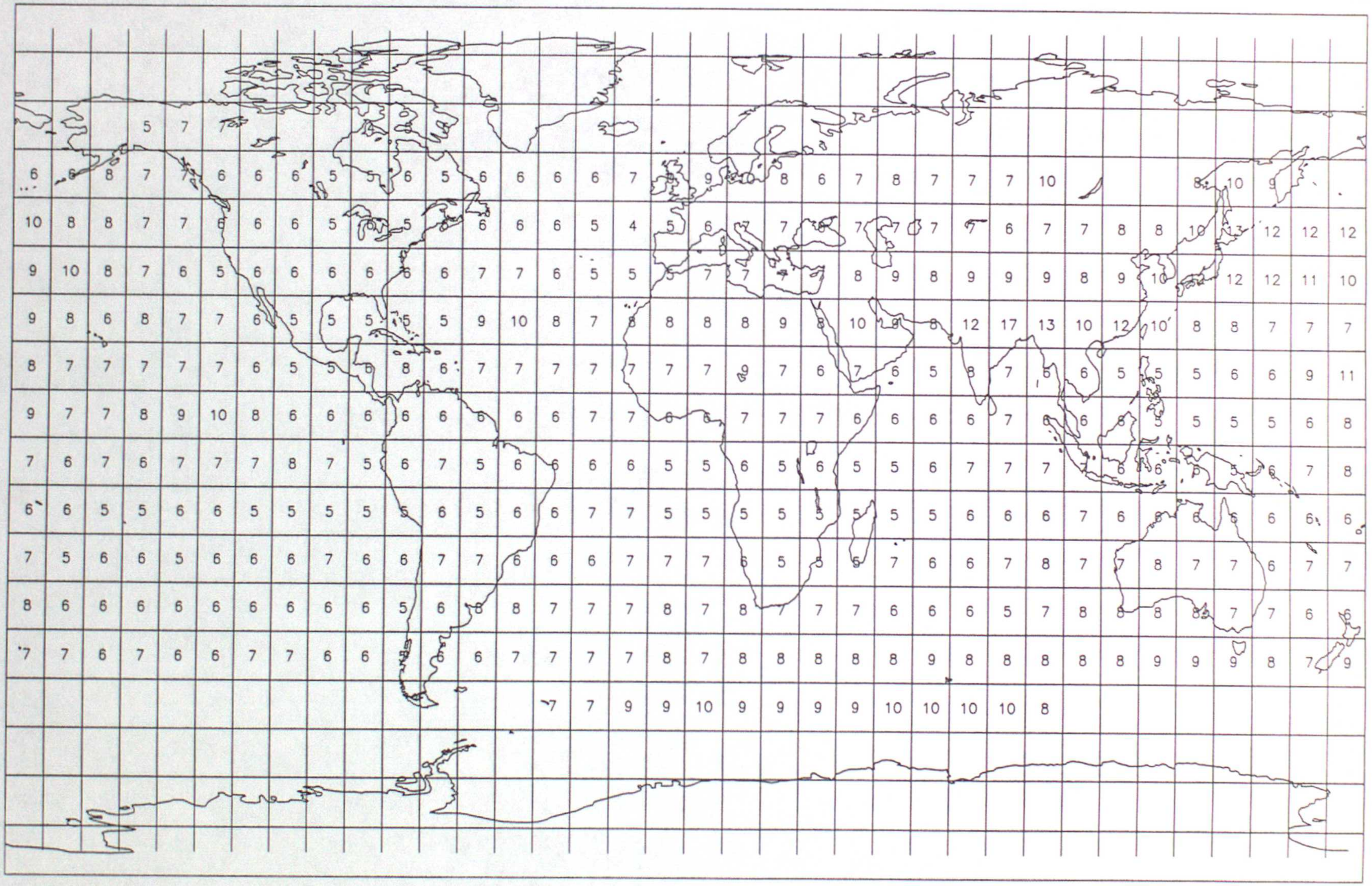
FIGURE 22


→ REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.6 -2.5 -4.9 -2.0 -1.6 -2.0
-.9 -1.9 -3.0 -2.0 -.8 -.6 -1.3 -1.1 -1.4 -.6 -1.1 -1.8 -.2 -.1 -.7 -.3 1.1 -2.0 -3.3 -4.8 -3.1 -1.6 -1.4 -2.4 -2.7 -2.7 -1.7 -4.8 -2.0 -2.0 -3.4
-1.2 -.2 .4 .2 .2 -.4 -1.4 -.8 -.3 -.4 1.1 -1.4 -.5 1.2 .4 .1 -1.0 -1.8 -1.7 -2.0 -1.3 -.9 -.9 -.8 -.5 -1.1 -2.0 -3.7 -4.1 -6.5 -4.3 -5.0 -4.7
-.4 -1.0 .2 .6 .7 .5 .0 -.9 -.4 .5 .6 1.0 -2.2 -1.3 -.4 .5 -1.0 -1.3 -1.1 -1.7 -1.0 -.7 -2.1 -2.9 -.9 -1.4 -2.0 -1.3 -1.0 -1.5 -2.7 -4.5 -4.3 -3.5 -1.9 -1.0
-1.2 -2.2 .7 .1 -.1 .0 -1.1 -.2 .3 .0 .7 -.4 -1.2 .1 -.6 .5 .7 2.4 .9 -.7 -2.0 -.8 -3.1 -2.4 2.0 -3.2 -8.8 -4.7 -3.7 -4.6 -.7 -.9 -.4 .3 -.5 -.1
-1.8 -1.2 -.8 -.3 -1.7 -1.4 -.6 -.3 .5 1.8 3.1 .4 1.9 .9 .9 .9 1.8 1.2 1.4 1.3 2.4 2.5 -.4 .4 2.2 2.6 2.1 1.5 1.3 1.3 .7 1.3 .9 1.3 1.7 .6
1.4 -.2 -.2 -1.0 -2.4 -3.5 .4 .5 .1 .5 .7 1.1 .8 1.7 1.6 1.5 1.1 1.0 .3 .7 .2 -.4 .0 .1 1.0 .7 1.0 .9 .5 -.8 -.4 .2 .2 .2 1.0 2.0
1.0 .2 .3 .9 1.5 .5 .2 -.1 -.1 .1 -1.3 -.7 -.6 .5 1.3 1.2 .1 .1 .0 -.2 -.2 .1 .9 -.2 .1 1.0 1.9 1.1 1.0 -.5 1.3 -1.1 -.4 1.0 1.0 1.1
.9 .6 1.2 2.0 2.6 2.1 2.1 1.1 1.5 1.1 .1 .3 .3 .7 1.8 2.7 .7 -.1 .2 .1 .4 .1 -.1 .3 .6 1.1 .6 .4 .3 .5 .1 .2 1.0 1.3 .8 .4
.9 .7 .8 1.2 1.2 .7 -.6 .2 .3 .4 1.2 .7 1.0 .0 .4 .7 -.4 -.7 .7 .2 .0 .3 -.2 1.1 1.6 .6 1.1 1.0 .9 .1 -1.1 1.3 .1 .7 1.3 .4
1.1 .7 .9 .2 1.2 -.3 -.9 -.8 -.9 .1 .6 -.5 -.6 -.1 .6 .9 -.1 .2 -.2 -1.4 -1.1 -1.3 -1.4 -.2 .9 -.5 .5 .0 .0 -.3 -1.7 -.3 .3 .4 .7 .2
.6 -.1 -.4 -1.5 .4 .7 -1.1 -1.5 -.6 -1.4 -.1 .1 .3 -.7 -.1 1.1 -.4 -.8 .0 -.9 -.6 -1.2 -.8 -.3 -.2 -.4 -.3 -1.0 -.1 -.6 -1.2 -3.6 -1.8 -1.3 .5 .1
-1.1 -1.0 .0 -1.8 -2.6 -1.4 -3.5 -3.6 -2.7 -3.5 -2.9 -2.1 -1.5 -1.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
MARCH 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			5	7	7																														
6	6	8	7	7	6	6	6	5	5	6	5	6	6	6	6	7	8	9	[illegible]	8	6	7	8	7	7	7	10				8	10	9		
10	8	8	7	7	6	6	6	5	6	5	6	6	6	6	5	4	5	6	7	7	8	7	7	7	7	6	7	7	8	8	10	13	12	12	12
9	10	8	7	6	5	6	6	6	6	6	6	7	7	6	5	5	5	7	7	7	7	8	9	8	9	9	9	8	9	10	12	12	12	11	10
9	8	6	8	7	7	6	5	5	5	5	5	9	10	8	7	8	8	8	8	9	8	10	9	8	12	17	13	10	12	10	8	8	7	7	7
8	7	7	7	7	7	6	5	5	6	8	6	7	7	7	7	7	7	7	9	7	6	7	6	5	8	7	6	6	5	5	5	6	6	9	11
9	7	7	8	9	10	8	6	6	6	6	6	6	6	6	7	7	6	6	7	7	7	6	6	6	6	7	6	6	8	5	5	5	5	6	8
7	6	7	6	7	7	7	8	7	5	6	7	5	6	6	6	6	5	5	6	5	6	5	5	6	7	7	7	7	6	6	[illegible]	5	6	7	8
6	6	5	5	6	6	5	5	5	5	5	6	5	6	6	7	7	5	5	5	5	5	5	5	5	6	6	6	7	6	8	6	6	6	6	6
7	5	6	6	5	6	6	6	7	6	6	7	7	6	6	6	7	7	7	6	5	5	5	7	6	6	7	8	7	7	8	7	7	6	7	7
8	6	6	6	6	6	6	6	6	6	5	6	8	8	7	7	7	8	7	8	7	7	7	6	6	6	5	7	8	8	8	8	7	7	6	6
7	7	6	7	6	6	7	7	6	6	5	6	6	7	7	7	7	8	7	8	8	8	8	8	9	8	8	8	8	8	9	9	9	8	7	9
														7	7	9	9	10	9	9	9	9	10	10	10	10	8								

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15.

Standard of comparison :Background field from UKMO global model.

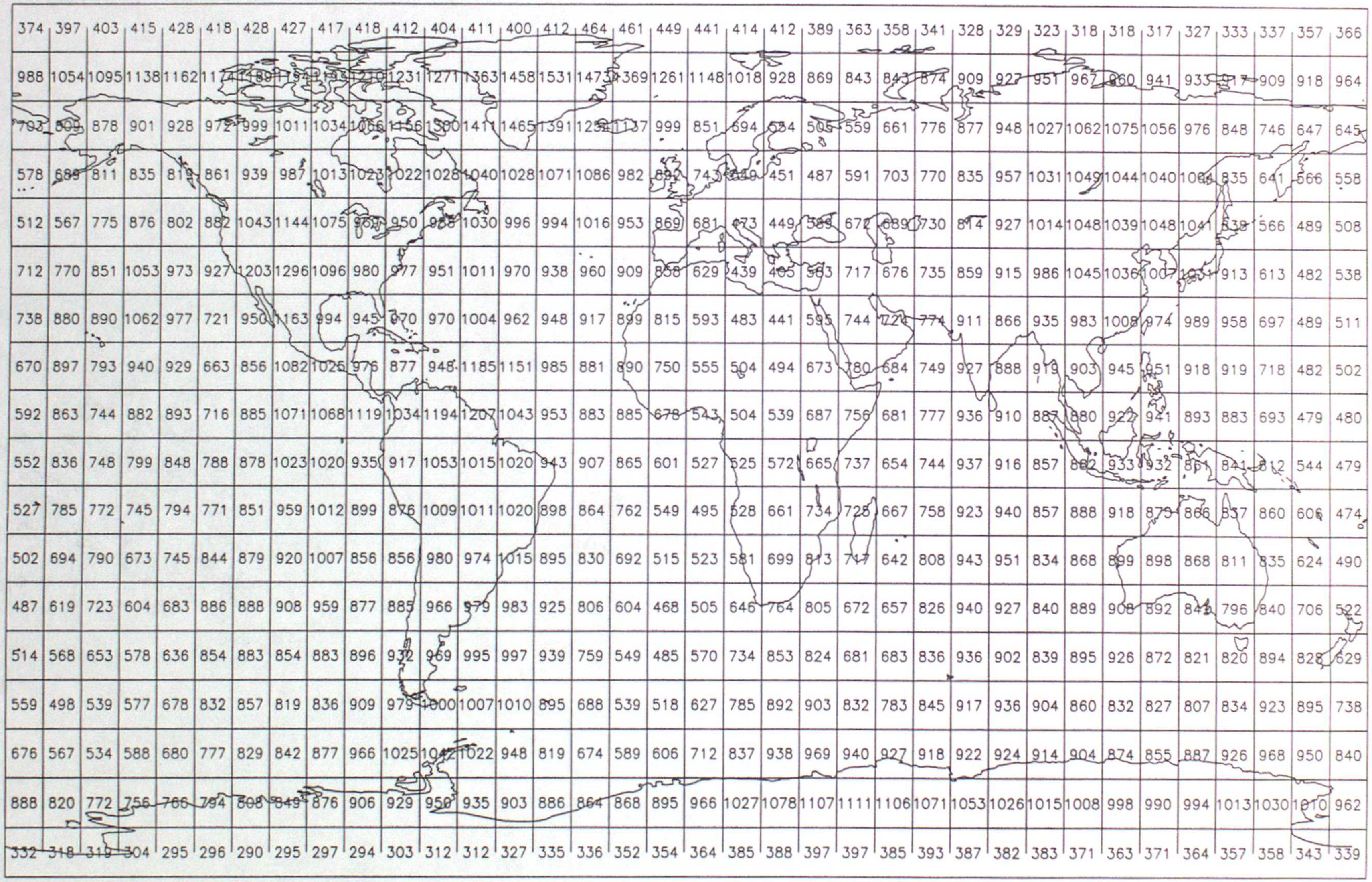
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)
HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

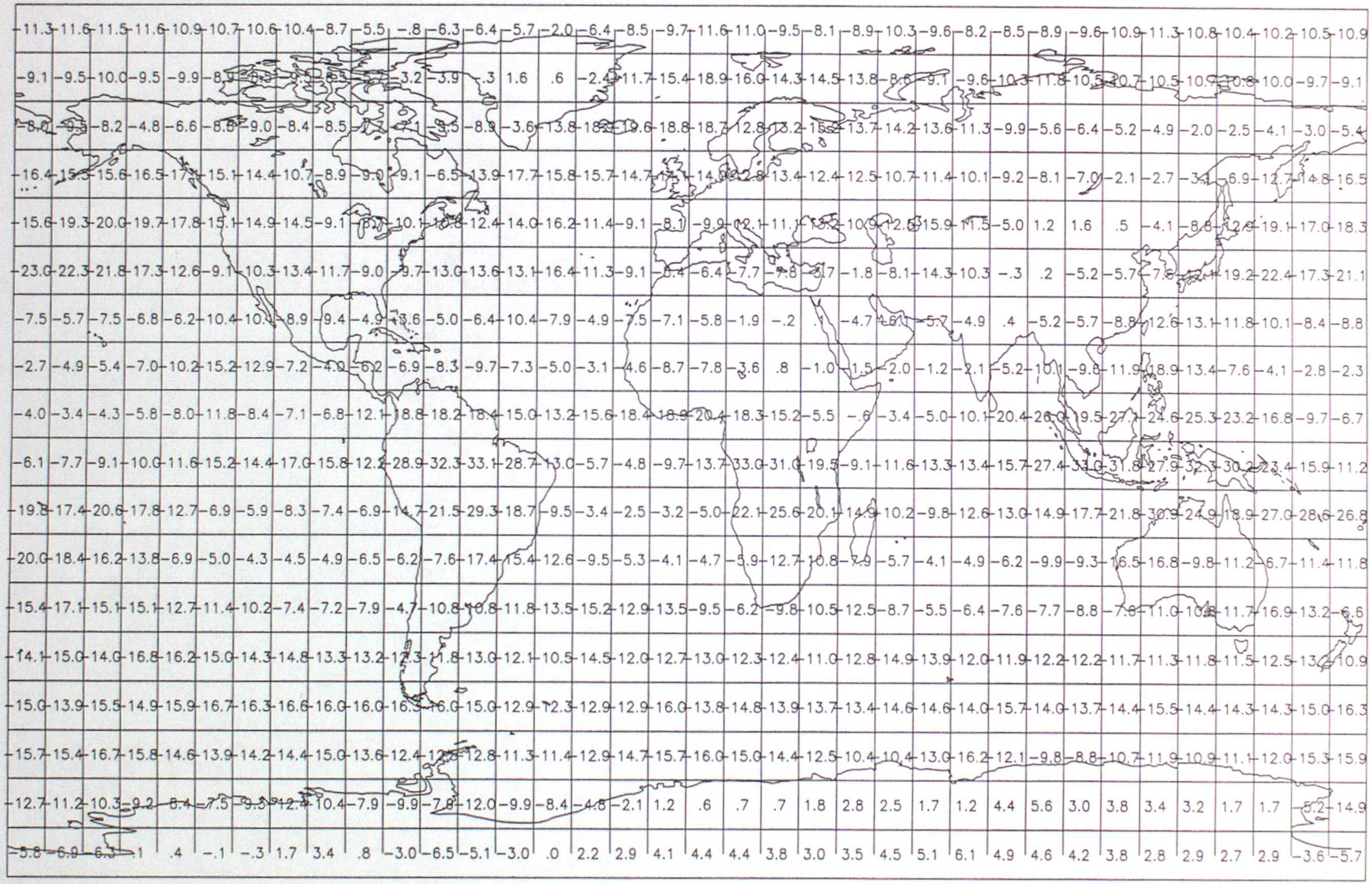
ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS
MARCH 2000
NOAA-15, USING ALL OBSERVATIONS

FIGURE 25



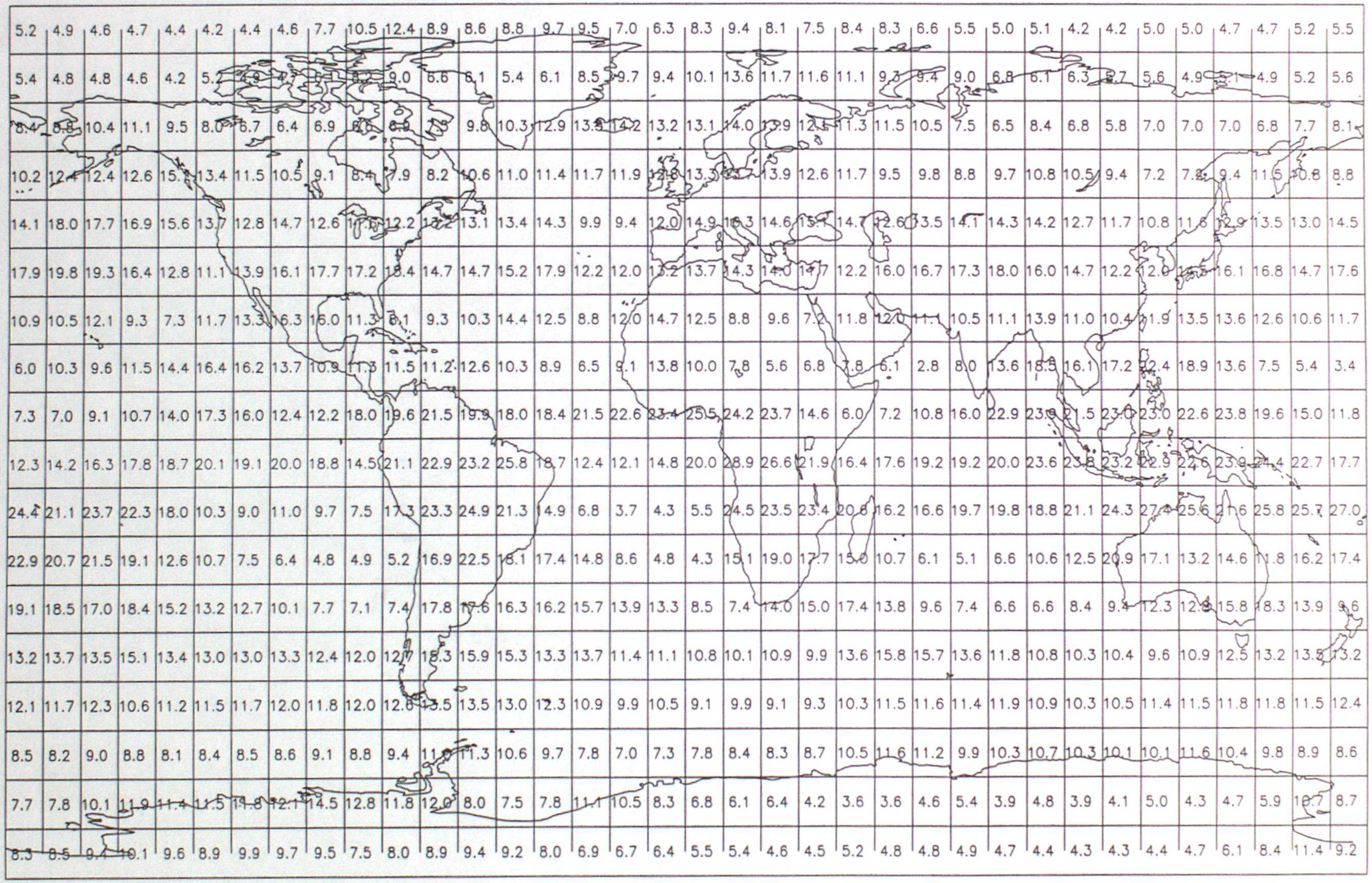
374	397	403	415	428	418	428	427	417	418	412	404	411	400	412	464	461	449	441	414	412	389	363	358	341	328	329	323	318	318	317	327	333	337	357	366
988	1054	1095	1138	1162	1174	1189	1194	1195	1210	1231	1271	1363	1458	1531	1473	1369	1261	1148	1018	928	869	843	843	874	909	927	951	967	960	941	933	917	909	918	964
793	809	878	901	928	972	999	1011	1034	1066	1156	1300	1411	1465	1391	1252	1137	999	851	694	634	505	559	661	776	877	948	1027	1062	1075	1056	976	848	746	647	645
578	689	811	835	819	861	939	987	1013	1023	1022	1028	1040	1028	1071	1086	982	892	743	549	451	487	591	703	770	835	957	1031	1049	1044	1040	1064	835	641	566	558
512	567	775	876	802	882	1043	1144	1075	969	950	988	1030	996	994	1016	953	869	681	473	449	589	672	689	730	814	927	1014	1048	1039	1048	1041	838	566	489	508
712	770	851	1053	973	927	1203	1296	1096	980	977	951	1011	970	938	960	909	858	629	439	405	583	717	676	735	859	915	986	1045	1036	1007	1031	913	613	482	538
738	880	890	1062	977	721	950	1163	994	945	970	970	1004	962	948	917	899	815	593	483	441	595	744	724	774	911	866	935	983	1008	974	989	958	697	489	511
670	897	793	940	929	663	856	1082	1025	976	877	948	1185	1151	985	881	890	750	555	504	494	673	780	684	749	927	888	919	903	945	951	918	919	718	482	502
592	863	744	882	893	716	885	1071	1068	1119	1034	1194	1207	1043	953	883	885	678	543	504	539	687	756	681	777	936	910	887	880	922	941	893	883	693	479	480
552	836	748	799	848	788	878	1023	1020	935	917	1053	1015	1020	943	907	865	601	527	525	572	665	737	654	744	937	916	857	882	933	932	861	841	812	544	479
527	785	772	745	794	771	851	959	1012	899	876	1009	1011	1020	898	864	762	549	495	528	661	734	725	667	758	923	940	857	888	918	873	866	857	860	606	474
502	694	790	673	745	844	879	920	1007	856	856	980	974	1015	895	830	692	515	523	581	699	813	717	642	808	943	951	834	868	899	898	868	811	835	624	490
487	619	723	604	683	886	888	908	959	877	885	966	979	983	925	806	604	468	505	646	764	805	672	657	826	940	927	840	889	908	892	843	796	840	706	522
514	568	653	578	636	854	883	854	883	896	932	969	995	997	939	759	549	485	570	734	853	824	681	683	836	936	902	839	895	926	872	821	820	894	828	629
559	498	539	577	678	832	857	819	836	909	979	1000	1007	1010	895	688	539	518	627	785	892	903	832	783	845	917	936	904	860	832	827	807	834	923	895	738
676	567	534	588	680	777	829	842	877	966	1025	1042	1022	948	819	674	589	606	712	837	938	969	940	927	918	922	924	914	904	874	855	887	926	968	950	840
888	820	772	756	766	794	808	849	876	906	929	950	935	903	886	864	868	895	966	1027	1078	1107	1111	1106	1071	1053	1026	1015	1008	998	990	994	1013	1030	1010	962
332	318	319	304	295	296	290	295	297	294	303	312	312	327	335	336	352	354	364	385	388	397	397	385	393	387	382	383	371	363	371	364	357	358	343	339

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 26
MARCH 2000 : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS



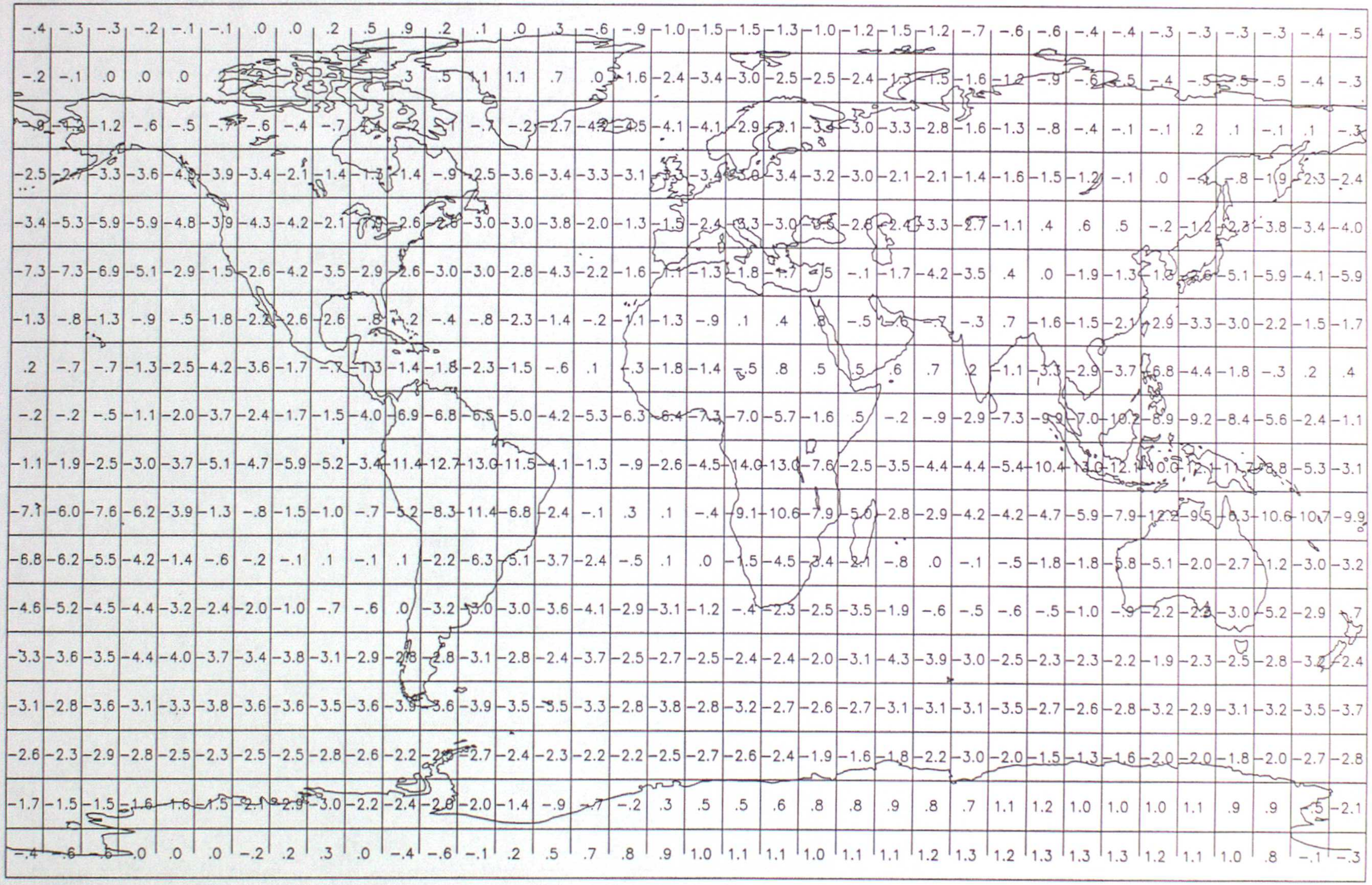
-11.3	-11.6	-11.5	-11.6	-10.9	-10.7	-10.6	-10.4	-8.7	-5.5	-.8	-6.3	-6.4	-5.7	-2.0	-6.4	-8.5	-9.7	-11.6	-11.0	-9.5	-8.1	-8.9	-10.3	-9.6	-8.2	-8.5	-8.9	-9.6	-10.9	-11.3	-10.8	-10.4	-10.2	-10.5	-10.9
-9.1	-9.5	-10.0	-9.5	-9.9	-8.9	[illegible]	-9.5	-8.5	-5.7	-3.2	-3.9	-.3	1.6	.6	-2.4	-11.7	-15.4	-18.9	-16.0	-14.3	-14.5	-13.8	-8.6	-9.1	-9.6	-10.3	-11.8	-10.5	-10.7	-10.5	-10.9	-10.8	-10.0	-9.7	-9.1
-8.0	-9.5	-8.2	-4.8	-6.6	-8.8	-9.0	-8.4	-8.5	-7.7	-7.1	-9.5	-8.9	-3.6	-13.8	[illegible]	-19.6	-18.8	-18.7	-12.8	-13.2	[illegible]	-13.7	-14.2	-13.6	-11.3	-9.9	-5.6	-6.4	-5.2	-4.9	-2.0	-2.5	-4.1	-3.0	-5.4
-16.4	-15.5	-15.6	-16.5	[illegible]	-15.1	-14.4	-10.7	-8.9	-9.0	-9.1	-6.5	-13.9	-17.7	-15.8	-15.7	-14.7	-14.1	-14.0	-12.8	-13.4	-12.4	-12.5	-10.7	-11.4	-10.1	-9.2	-8.1	-7.0	-2.1	-2.7	-3.1	-6.9	-12.7	-14.8	-16.5
-15.6	-19.3	-20.0	-19.7	-17.8	-15.1	-14.9	-14.5	-9.1	-8.7	-10.1	-10.8	-12.4	-14.0	-16.2	-11.4	-9.1	-8.1	-9.9	-12.1	-11.1	-13.2	-10.9	-12.6	-15.9	-11.5	-5.0	1.2	1.6	.5	-4.1	-8.8	-12.9	-19.1	-17.0	-18.3
-23.0	-22.3	-21.8	-17.3	-12.6	-9.1	-10.3	-13.4	-11.7	-9.0	-9.7	-13.0	-13.6	-13.1	-16.4	-11.3	-9.1	-8.4	-6.4	-7.7	-7.8	-3.7	-1.8	-8.1	-14.3	-10.3	-.3	.2	-5.2	-5.7	-7.6	-12.1	-19.2	-22.4	-17.3	-21.1
-7.5	-5.7	-7.5	-6.8	-6.2	-10.4	-10.1	-8.9	-9.4	-4.9	-3.6	-5.0	-6.4	-10.4	-7.9	-4.9	-7.5	-7.1	-5.8	-1.9	-.2	.1	-4.7	-6.1	-5.7	-4.9	.4	-5.2	-5.7	-8.8	-12.6	-13.1	-11.8	-10.1	-8.4	-8.8
-2.7	-4.9	-5.4	-7.0	-10.2	-15.2	-12.9	-7.2	-4.0	-6.2	-6.9	-8.3	-9.7	-7.3	-5.0	-3.1	-4.6	-8.7	-7.8	-3.6	.8	-1.0	-1.5	-2.0	-1.2	-2.1	-5.2	-10.1	-9.6	-11.9	-18.9	-13.4	-7.6	-4.1	-2.8	-2.3
-4.0	-3.4	-4.3	-5.8	-8.0	-11.8	-8.4	-7.1	-6.8	-12.1	-18.8	-18.2	-18.4	-15.0	-13.2	-15.6	-18.4	-18.9	-20.4	-18.3	-15.2	-5.5	-.6	-3.4	-5.0	-10.1	-20.4	-26.0	-19.5	-27.1	-24.6	-25.3	-23.2	-16.8	-9.7	-6.7
-6.1	-7.7	-9.1	-10.0	-11.6	-15.2	-14.4	-17.0	-15.8	-12.2	-28.9	-32.3	-33.1	-28.7	-13.0	-5.7	-4.8	-9.7	-13.7	-33.0	-31.0	-19.5	-9.1	-11.6	-13.3	-13.4	-15.7	-27.4	-33.0	-31.8	-27.9	-32.3	-30.2	-23.4	-15.9	-11.2
-19.8	-17.4	-20.6	-17.8	-12.7	-6.9	-5.9	-8.3	-7.4	-6.9	-14.7	-21.5	-29.3	-18.7	-9.5	-3.4	-2.5	-3.2	-5.0	-22.1	-25.6	-20.1	-14.9	-10.2	-9.8	-12.6	-13.0	-14.9	-17.7	-21.8	-30.9	-24.9	-18.9	-27.0	-28.6	-26.8
-20.0	-18.4	-16.2	-13.8	-6.9	-5.0	-4.3	-4.5	-4.9	-6.5	-6.2	-7.6	-17.4	-15.4	-12.6	-9.5	-5.3	-4.1	-4.7	-5.9	-12.7	-10.8	-7.9	-5.7	-4.1	-4.9	-6.2	-9.9	-9.3	-16.5	-16.8	-9.8	-11.2	-6.7	-11.4	-11.8
-15.4	-17.1	-15.1	-15.1	-12.7	-11.4	-10.2	-7.4	-7.2	-7.9	-4.7	-10.8	-10.8	-11.8	-13.5	-15.2	-12.9	-13.5	-9.5	-6.2	-9.8	-10.5	-12.5	-8.7	-5.5	-6.4	-7.6	-7.7	-8.8	-7.6	-11.0	-10.8	-11.7	-16.9	-13.2	-6.6
-14.1	-15.0	-14.0	-16.8	-16.2	-15.0	-14.3	-14.8	-13.3	-13.2	-12.3	-11.8	-13.0	-12.1	-10.5	-14.5	-12.0	-12.7	-13.0	-12.3	-12.4	-11.0	-12.8	-14.9	-13.9	-12.0	-11.9	-12.2	-12.2	-11.7	-11.3	-11.8	-11.5	-12.5	-13.2	-10.9
-15.0	-13.9	-15.5	-14.9	-15.9	-16.7	-16.3	-16.6	-16.0	-16.0	-16.3	-16.0	-15.0	-12.9	-12.3	-12.9	-12.9	-16.0	-13.8	-14.8	-13.9	-13.7	-13.4	-14.6	-14.6	-14.0	-15.7	-14.0	-13.7	-14.4	-15.5	-14.4	-14.3	-14.3	-15.0	-16.3
-15.7	-15.4	-16.7	-15.8	-14.6	-13.9	-14.2	-14.4	-15.0	-13.6	-12.4	[illegible]	-12.8	-11.3	-11.4	-12.9	-14.7	-15.7	-16.0	-15.0	-14.4	-12.5	-10.4	-10.4	-13.0	-16.2	-12.1	-9.8	-8.8	-10.7	-11.9	-10.9	-11.1	-12.0	-15.3	-15.9
-12.7	-11.2	-10.3	-9.2	-8.4	-7.5	-9.5	-12.4	-10.4	-7.9	-9.9	-7.8	-12.0	-9.9	-8.4	-4.8	-2.1	1.2	.6	.7	.7	1.8	2.8	2.5	1.7	1.2	4.4	5.6	3.0	3.8	3.4	3.2	1.7	1.7	-5.2	-14.9
-5.8	-6.9	-6.3	.1	.4	-.1	-.3	1.7	3.4	.8	-3.0	-6.5	-5.1	-3.0	.0	2.2	2.9	4.1	4.4	4.4	3.8	3.0	3.5	4.5	5.1	6.1	4.9	4.6	4.2	3.8	2.8	2.9	2.7	2.9	-3.6	-5.7

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)   FIGURE 27
MARCH 2000   : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS



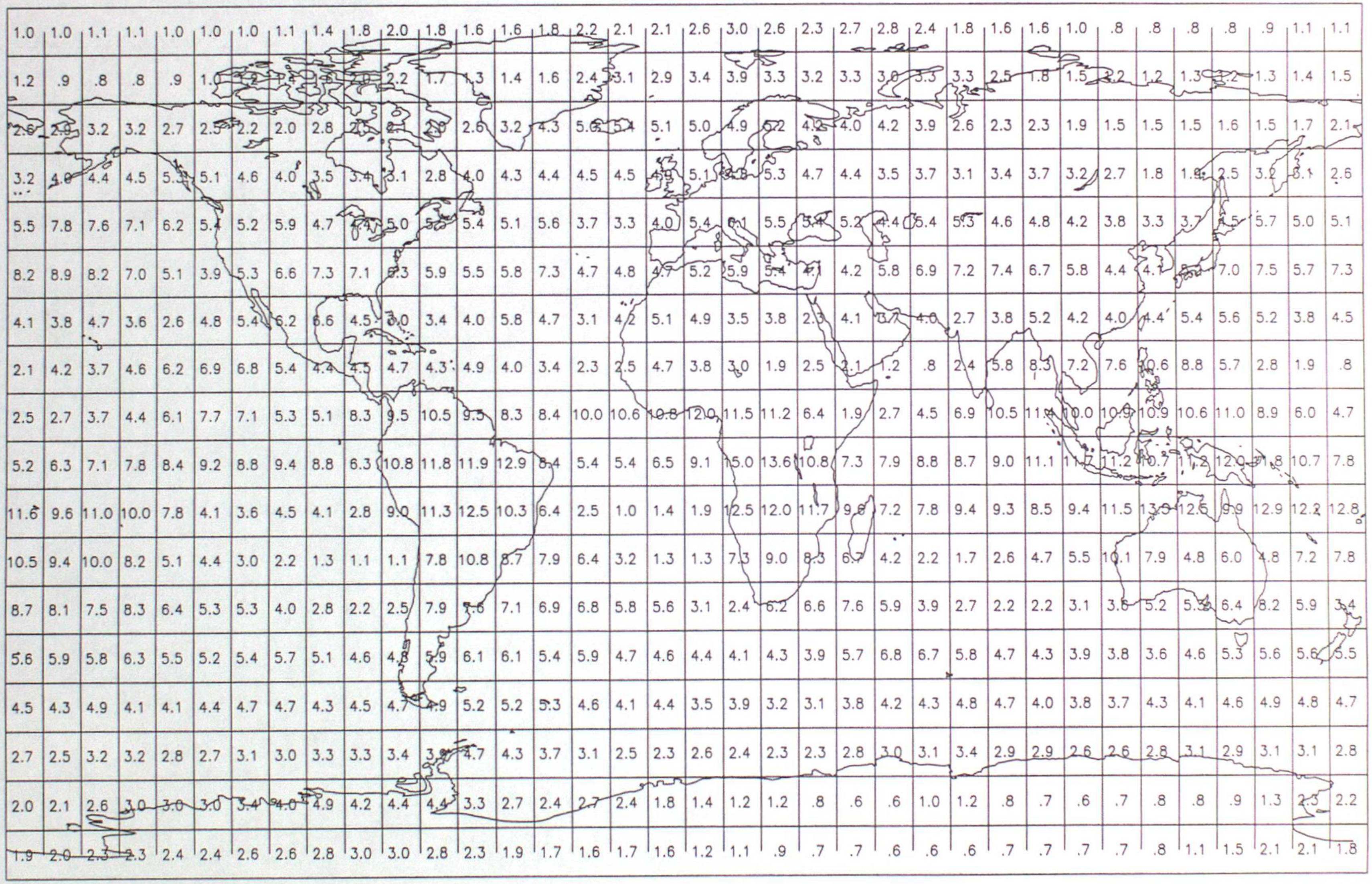
5.2	4.9	4.6	4.7	4.4	4.2	4.4	4.6	7.7	10.5	12.4	8.9	8.6	8.8	9.7	9.5	7.0	6.3	8.3	9.4	8.1	7.5	8.4	8.3	6.6	5.5	5.0	5.1	4.2	4.2	5.0	5.0	4.7	4.7	5.2	5.5
5.4	4.8	4.8	4.6	4.2	5.2	4.9	4.7	6.1	8.2	9.0	6.6	6.1	5.4	6.1	8.5	9.7	9.4	10.1	13.6	11.7	11.6	11.1	9.3	9.4	9.0	6.8	6.1	6.3	5.7	5.6	4.9	5.1	4.9	5.2	5.6
8.4	8.8	10.4	11.1	9.5	8.0	6.7	6.4	6.9	8.6	6.9	7.5	9.8	10.3	12.9	13.3	14.2	13.2	13.1	14.0	13.9	12.5	11.3	11.5	10.5	7.5	6.5	8.4	6.8	5.8	7.0	7.0	7.0	6.8	7.7	8.1
10.2	12.4	12.4	12.6	15.1	13.4	11.5	10.5	9.1	8.4	7.9	8.2	10.6	11.0	11.4	11.7	11.9	12.8	13.3	13.7	13.9	12.6	11.7	9.5	9.8	8.8	9.7	10.8	10.5	9.4	7.2	7.2	9.4	11.5	10.8	8.8
14.1	18.0	17.7	16.9	15.6	13.7	12.8	14.7	12.6	11.6	12.2	13.2	13.1	13.4	14.3	9.9	9.4	12.0	14.9	16.3	14.6	15.1	14.7	12.6	13.5	14.1	14.3	14.2	12.7	11.7	10.8	11.6	12.9	13.5	13.0	14.5
17.9	19.8	19.3	16.4	12.8	11.1	13.9	16.1	17.7	17.2	18.4	14.7	14.7	15.2	17.9	12.2	12.0	13.2	13.7	14.3	14.0	14.7	12.2	16.0	16.7	17.3	18.0	16.0	14.7	12.2	12.0	15.5	16.1	16.8	14.7	17.6
10.9	10.5	12.1	9.3	7.3	11.7	13.3	16.3	16.0	11.3	8.1	9.3	10.3	14.4	12.5	8.8	12.0	14.7	12.5	8.8	9.6	7.2	11.8	12.0	11.1	10.5	11.1	13.9	11.0	10.4	11.9	13.5	13.6	12.6	10.6	11.7
6.0	10.3	9.6	11.5	14.4	16.4	16.2	13.7	10.9	11.3	11.5	11.2	12.6	10.3	8.9	6.5	9.1	13.8	10.0	7.8	5.6	6.8	7.8	6.1	2.8	8.0	13.6	18.5	16.1	17.2	22.4	18.9	13.6	7.5	5.4	3.4
7.3	7.0	9.1	10.7	14.0	17.3	16.0	12.4	12.2	18.0	19.6	21.5	19.9	18.0	18.4	21.5	22.6	23.4	25.5	24.2	23.7	14.6	6.0	7.2	10.8	16.0	22.9	23.9	21.5	23.0	23.0	22.6	23.8	19.6	15.0	11.8
12.3	14.2	16.3	17.8	18.7	20.1	19.1	20.0	18.8	14.5	21.1	22.9	23.2	25.8	18.7	12.4	12.1	14.8	20.0	28.9	26.6	21.9	16.4	17.6	19.2	19.2	20.0	23.6	23.8	23.2	22.9	22.6	23.9	24.4	22.7	17.7
24.4	21.1	23.7	22.3	18.0	10.3	9.0	11.0	9.7	7.5	17.3	23.3	24.9	21.3	14.9	6.8	3.7	4.3	5.5	24.5	23.5	23.4	20.6	16.2	16.6	19.7	19.8	18.8	21.1	24.3	27.4	25.6	21.6	25.8	25.7	27.0
22.9	20.7	21.5	19.1	12.6	10.7	7.5	6.4	4.8	4.9	5.2	16.9	22.5	18.1	17.4	14.8	8.6	4.8	4.3	15.1	19.0	17.7	15.0	10.7	6.1	5.1	6.6	10.6	12.5	20.9	17.1	13.2	14.6	11.8	16.2	17.4
19.1	18.5	17.0	18.4	15.2	13.2	12.7	10.1	7.7	7.1	7.4	17.8	17.6	16.3	16.2	15.7	13.9	13.3	8.5	7.4	14.0	15.0	17.4	13.8	9.6	7.4	6.6	6.6	8.4	9.4	12.3	12.8	15.8	18.3	13.9	9.6
13.2	13.7	13.5	15.1	13.4	13.0	13.0	13.3	12.4	12.0	12.7	18.3	15.9	15.3	13.3	13.7	11.4	11.1	10.8	10.1	10.9	9.9	13.6	15.8	15.7	13.6	11.8	10.8	10.3	10.4	9.6	10.9	12.5	13.2	13.5	13.2
12.1	11.7	12.3	10.6	11.2	11.5	11.7	12.0	11.8	12.0	12.6	13.5	13.5	13.0	12.3	10.9	9.9	10.5	9.1	9.9	9.1	9.3	10.3	11.5	11.6	11.4	11.9	10.9	10.3	10.5	11.4	11.5	11.8	11.8	11.5	12.4
8.5	8.2	9.0	8.8	8.1	8.4	8.5	8.6	9.1	8.8	9.4	11.0	11.3	10.6	9.7	7.8	7.0	7.3	7.8	8.4	8.3	8.7	10.5	11.6	11.2	9.9	10.3	10.7	10.3	10.1	10.1	11.6	10.4	9.8	8.9	8.6
7.7	7.8	10.1	11.9	11.4	11.5	11.8	12.1	14.5	12.8	11.8	12.0	8.0	7.5	7.8	11.1	10.5	8.3	6.8	6.1	6.4	4.2	3.6	3.6	4.6	5.4	3.9	4.8	3.9	4.1	5.0	4.3	4.7	5.9	10.7	8.7
8.3	8.5	9.4	10.1	9.6	8.9	9.9	9.7	9.5	7.5	8.0	8.9	9.4	9.2	8.0	6.9	6.7	6.4	5.5	5.4	4.6	4.5	5.2	4.8	4.8	4.9	4.7	4.4	4.3	4.3	4.4	4.7	6.1	8.4	11.4	9.2

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 28
MARCH 2000 : HIRS15 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS


-.4 -.3 -.3 -.2 -.1 -.1 .0 .0 .2 .5 .9 .2 .1 .0 .3 -.6 -.9 -1.0 -1.5 -1.5 -1.3 -1.0 -1.2 -1.5 -1.2 -.7 -.6 -.6 -.4 -.4 -.3 -.3 -.3 -.3 -.4 -.5
-.2 -.1 .0 .0 .0 .2 .2 .0 .3 .5 1.1 1.1 .7 .0 -1.6 -2.4 -3.4 -3.0 -2.5 -2.5 -2.4 -1.3 -1.5 -1.6 -1.2 -.9 -.6 -.5 -.4 -.5 -.5 -.5 -.4 -.3
-.9 -1.3 -1.2 -.6 -.5 -.7 -.6 -.4 -.7 -1.4 -.2 -.1 -.7 -.2 -2.7 -4.2 -4.5 -4.1 -4.1 -2.9 -3.1 -3.4 -3.0 -3.3 -2.8 -1.6 -1.3 -.8 -.4 -.1 -.1 .2 .1 -.1 .1 -.3
-2.5 -2.7 -3.3 -3.6 -4.5 -3.9 -3.4 -2.1 -1.4 -1.3 -1.4 -.9 -2.5 -3.6 -3.4 -3.3 -3.1 -3.3 -3.4 -3.0 -3.4 -3.2 -3.0 -2.1 -2.1 -1.4 -1.6 -1.5 -1.2 -.1 .0 -.4 -.8 -1.9 -2.3 -2.4
-3.4 -5.3 -5.9 -5.9 -4.8 -3.9 -4.3 -4.2 -2.1 -1.9 -2.6 -2.8 -3.0 -3.0 -3.8 -2.0 -1.3 -1.5 -2.4 -3.3 -3.0 -3.5 -2.8 -2.4 -3.3 -2.7 -1.1 .4 .6 .5 -.2 -1.2 -2.3 -3.8 -3.4 -4.0
-7.3 -7.3 -6.9 -5.1 -2.9 -1.5 -2.6 -4.2 -3.5 -2.9 -2.6 -3.0 -3.0 -2.8 -4.3 -2.2 -1.6 -1.1 -1.3 -1.8 -1.7 -.5 -.1 -1.7 -4.2 -3.5 .4 .0 -1.9 -1.3 -1.6 -2.6 -5.1 -5.9 -4.1 -5.9
-1.3 -.8 -1.3 -.9 -.5 -1.8 -2.2 -2.6 -2.6 -.8 -.2 -.4 -.8 -2.3 -1.4 -.2 -1.1 -1.3 -.9 .1 .4 .8 -.5 -.6 -.7 -.3 .7 -1.6 -1.5 -2.1 -2.9 -3.3 -3.0 -2.2 -1.5 -1.7
.2 -.7 -.7 -1.3 -2.5 -4.2 -3.6 -1.7 -.7 -1.3 -1.4 -1.8 -2.3 -1.5 -.6 .1 -.3 -1.8 -1.4 .5 .8 .5 .5 .6 .7 .2 -1.1 -3.3 -2.9 -3.7 -6.8 -4.4 -1.8 -.3 .2 .4
-.2 -.2 -.5 -1.1 -2.0 -3.7 -2.4 -1.7 -1.5 -4.0 -6.9 -6.8 -6.5 -5.0 -4.2 -5.3 -6.3 -6.4 -7.3 -7.0 -5.7 -1.6 .5 -.2 -.9 -2.9 -7.3 -9.9 -7.0 -10.2 -8.9 -9.2 -8.4 -5.6 -2.4 -1.1
-1.1 -1.9 -2.5 -3.0 -3.7 -5.1 -4.7 -5.9 -5.2 -3.4 -11.4 -12.7 -13.0 -11.5 -4.1 -1.3 -.9 -2.6 -4.5 -14.0 -13.0 -7.6 -2.5 -3.5 -4.4 -4.4 -5.4 -10.4 -13.0 -12.1 -10.0 -12.1 -11.7 -8.8 -5.3 -3.1
-7.1 -6.0 -7.6 -6.2 -3.9 -1.3 -.8 -1.5 -1.0 -.7 -5.2 -8.3 -11.4 -6.8 -2.4 -.1 .3 .1 -.4 -9.1 -10.6 -7.9 -5.0 -2.8 -2.9 -4.2 -4.2 -4.7 -5.9 -7.9 -12.2 -9.5 -8.3 -10.6 -10.7 -9.9
-6.8 -6.2 -5.5 -4.2 -1.4 -.6 -.2 -.1 .1 -.1 .1 -2.2 -6.3 -5.1 -3.7 -2.4 -.5 .1 .0 -1.5 -4.5 -3.4 -2.1 -.8 .0 -.1 -.5 -1.8 -1.8 -5.8 -5.1 -2.0 -2.7 -1.2 -3.0 -3.2
-4.6 -5.2 -4.5 -4.4 -3.2 -2.4 -2.0 -1.0 -.7 -.6 .0 -3.2 -3.0 -3.0 -3.6 -4.1 -2.9 -3.1 -1.2 -.4 -2.3 -2.5 -3.5 -1.9 -.6 -.5 -.6 -.5 -1.0 -.9 -2.2 -2.3 -3.0 -5.2 -2.9 -.7
-3.3 -3.6 -3.5 -4.4 -4.0 -3.7 -3.4 -3.8 -3.1 -2.9 -2.8 -2.8 -3.1 -2.8 -2.4 -3.7 -2.5 -2.7 -2.5 -2.4 -2.4 -2.0 -3.1 -4.3 -3.9 -3.0 -2.5 -2.3 -2.3 -2.2 -1.9 -2.3 -2.5 -2.8 -3.2 -2.4
-3.1 -2.8 -3.6 -3.1 -3.3 -3.8 -3.6 -3.6 -3.5 -3.6 -3.9 -3.6 -3.9 -3.5 -3.5 -3.3 -2.8 -3.8 -2.8 -3.2 -2.7 -2.6 -2.7 -3.1 -3.1 -3.1 -3.5 -2.7 -2.6 -2.8 -3.2 -2.9 -3.1 -3.2 -3.5 -3.7
-2.6 -2.3 -2.9 -2.8 -2.5 -2.3 -2.5 -2.5 -2.8 -2.6 -2.2 -2.8 -2.7 -2.4 -2.3 -2.2 -2.2 -2.5 -2.7 -2.6 -2.4 -1.9 -1.6 -1.8 -2.2 -3.0 -2.0 -1.5 -1.3 -1.6 -2.0 -2.0 -1.8 -2.0 -2.7 -2.8
-1.7 -1.5 -1.5 -1.6 -1.6 -1.5 -2.1 -2.9 -3.0 -2.2 -2.4 -2.8 -2.0 -1.4 -.9 -.7 -.2 .3 .5 .5 .6 .8 .8 .9 .8 .7 1.1 1.2 1.0 1.0 1.0 1.1 .9 .9 -.5 -2.1
-.4 -.6 -.6 .0 .0 .0 -.2 .2 .3 .0 -.4 -.6 -.1 .2 .5 .7 .8 .9 1.0 1.1 1.1 1.0 1.1 1.1 1.2 1.3 1.2 1.3 1.3 1.3 1.2 1.1 1.0 .8 -.1 -.3

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
MARCH 2000 : HIRS15 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

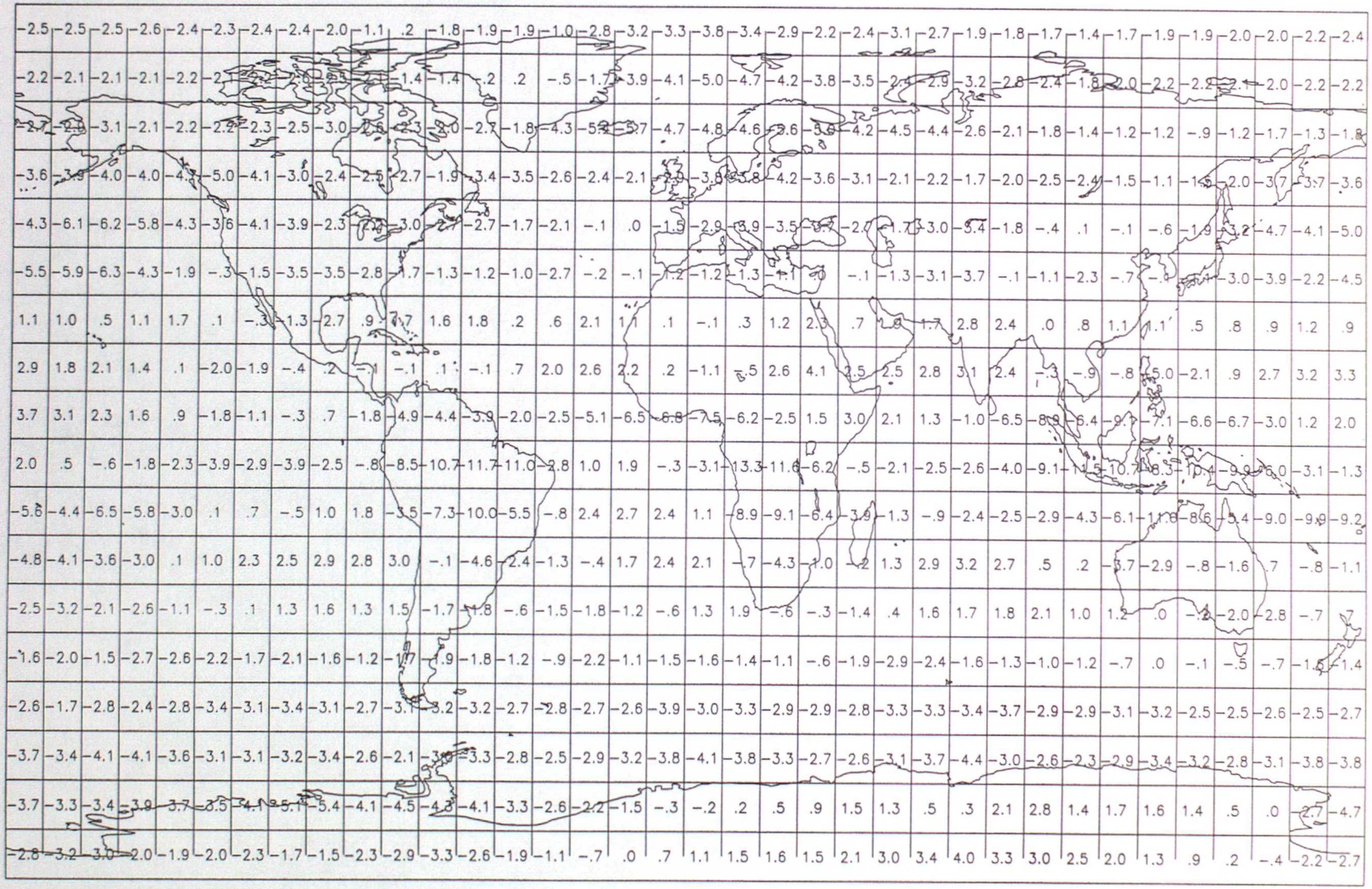
FIGURE 29



1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.1	1.4	1.8	2.0	1.8	1.6	1.6	1.8	2.2	2.1	2.1	2.6	3.0	2.6	2.3	2.7	2.8	2.4	1.8	1.6	1.6	1.0	.8	.8	.8	.8	.9	1.1	1.1
1.2	.9	.8	.8	.9	1.0	1.2	1.4	1.5	2.0	2.2	1.7	1.3	1.4	1.6	2.4	3.1	2.9	3.4	3.9	3.3	3.2	3.3	3.0	3.3	3.3	2.5	1.8	1.5	2.2	1.2	1.3	1.2	1.3	1.4	1.5
2.6	2.9	3.2	3.2	2.7	2.5	2.2	2.0	2.8	2.5	2.1	2.0	2.6	3.2	4.3	5.6	5.4	5.1	5.0	4.9	5.2	4.2	4.0	4.2	3.9	2.6	2.3	2.3	1.9	1.5	1.5	1.5	1.6	1.5	1.7	2.1
3.2	4.0	4.4	4.5	5.3	5.1	4.6	4.0	3.5	3.4	3.1	2.8	4.0	4.3	4.4	4.5	4.5	4.9	5.1	5.8	5.3	4.7	4.4	3.5	3.7	3.1	3.4	3.7	3.2	2.7	1.8	1.9	2.5	3.2	3.1	2.6
5.5	7.8	7.6	7.1	6.2	5.4	5.2	5.9	4.7	4.4	5.0	5.5	5.4	5.1	5.6	3.7	3.3	4.0	5.4	6.1	5.5	5.4	5.2	4.4	5.4	5.3	4.6	4.8	4.2	3.8	3.3	3.7	4.5	5.7	5.0	5.1
8.2	8.9	8.2	7.0	5.1	3.9	5.3	6.6	7.3	7.1	6.3	5.9	5.5	5.8	7.3	4.7	4.8	4.7	5.2	5.9	5.4	4.1	4.2	5.8	6.9	7.2	7.4	6.7	5.8	4.4	4.1	[illegible]	7.0	7.5	5.7	7.3
4.1	3.8	4.7	3.6	2.6	4.8	5.4	6.2	6.6	4.5	3.0	3.4	4.0	5.8	4.7	3.1	4.2	5.1	4.9	3.5	3.8	2.3	4.1	3.7	4.0	2.7	3.8	5.2	4.2	4.0	4.4	5.4	5.6	5.2	3.8	4.5
2.1	4.2	3.7	4.6	6.2	6.9	6.8	5.4	4.4	4.5	4.7	4.3	4.9	4.0	3.4	2.3	2.5	4.7	3.8	3.0	1.9	2.5	2.1	1.2	.8	2.4	5.8	8.3	7.2	7.6	10.6	8.8	5.7	2.8	1.9	.8
2.5	2.7	3.7	4.4	6.1	7.7	7.1	5.3	5.1	8.3	9.5	10.5	9.5	8.3	8.4	10.0	10.6	10.8	12.0	11.5	11.2	6.4	1.9	2.7	4.5	6.9	10.5	11.4	10.0	10.9	10.9	10.6	11.0	8.9	6.0	4.7
5.2	6.3	7.1	7.8	8.4	9.2	8.8	9.4	8.8	6.3	10.8	11.8	11.9	12.9	8.4	5.4	5.4	6.5	9.1	15.0	13.6	10.8	7.3	7.9	8.8	8.7	9.0	11.1	11.7	11.2	10.7	11.2	12.0	11.8	10.7	7.8
11.6	9.6	11.0	10.0	7.8	4.1	3.6	4.5	4.1	2.8	9.0	11.3	12.5	10.3	6.4	2.5	1.0	1.4	1.9	12.5	12.0	11.7	9.8	7.2	7.8	9.4	9.3	8.5	9.4	11.5	13.5	12.6	9.9	12.9	12.2	12.8
10.5	9.4	10.0	8.2	5.1	4.4	3.0	2.2	1.3	1.1	1.1	7.8	10.8	8.7	7.9	6.4	3.2	1.3	1.3	7.3	9.0	8.3	6.7	4.2	2.2	1.7	2.6	4.7	5.5	10.1	7.9	4.8	6.0	4.8	7.2	7.8
8.7	8.1	7.5	8.3	6.4	5.3	5.3	4.0	2.8	2.2	2.5	7.9	7.6	7.1	6.9	6.8	5.8	5.6	3.1	2.4	6.2	6.6	7.6	5.9	3.9	2.7	2.2	2.2	3.1	3.6	5.2	5.3	6.4	8.2	5.9	3.4
5.6	5.9	5.8	6.3	5.5	5.2	5.4	5.7	5.1	4.6	4.8	5.9	6.1	6.1	5.4	5.9	4.7	4.6	4.4	4.1	4.3	3.9	5.7	6.8	6.7	5.8	4.7	4.3	3.9	3.8	3.6	4.6	5.3	5.6	5.6	5.5
4.5	4.3	4.9	4.1	4.1	4.4	4.7	4.7	4.3	4.5	4.7	4.9	5.2	5.2	5.3	4.6	4.1	4.4	3.5	3.9	3.2	3.1	3.8	4.2	4.3	4.8	4.7	4.0	3.8	3.7	4.3	4.1	4.6	4.9	4.8	4.7
2.7	2.5	3.2	3.2	2.8	2.7	3.1	3.0	3.3	3.3	3.4	3.9	4.7	4.3	3.7	3.1	2.5	2.3	2.6	2.4	2.3	2.3	2.8	3.0	3.1	3.4	2.9	2.9	2.6	2.6	2.8	3.1	2.9	3.1	3.1	2.8
2.0	2.1	2.6	3.0	3.0	3.0	3.4	4.0	4.9	4.2	4.4	4.4	3.3	2.7	2.4	2.7	2.4	1.8	1.4	1.2	1.2	.8	.6	.6	1.0	1.2	.8	.7	.6	.7	.8	.8	.9	1.3	2.3	2.2
1.9	2.0	2.3	2.3	2.4	2.4	2.6	2.6	2.8	3.0	3.0	2.8	2.3	1.9	1.7	1.6	1.7	1.6	1.2	1.1	.9	.7	.7	.6	.6	.6	.7	.7	.7	.7	.8	1.1	1.5	2.1	2.1	1.8

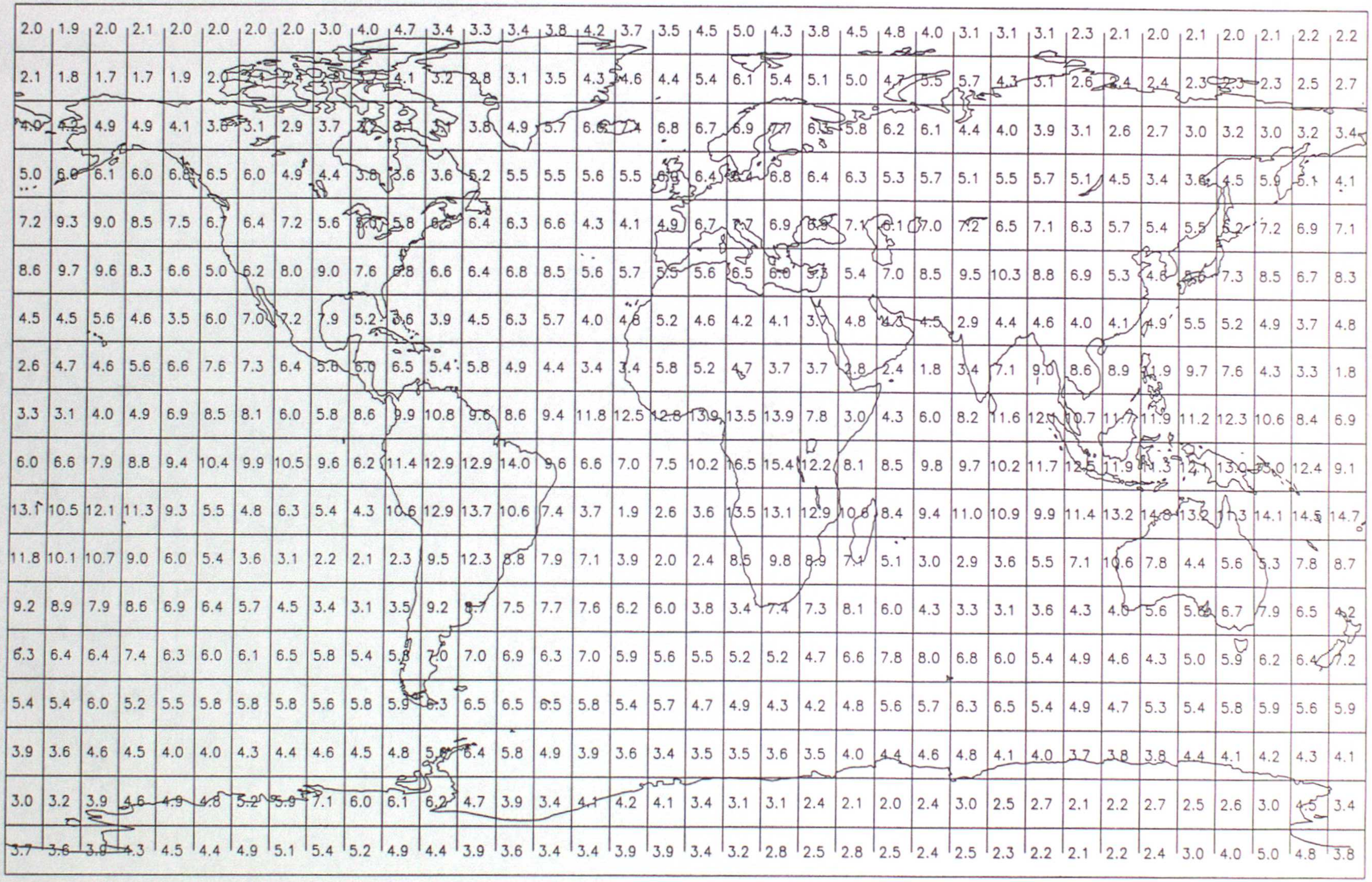
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
MARCH 2000 : HIRS11 Channel (500–700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 30


-2.5 -2.5 -2.5 -2.6 -2.4 -2.3 -2.4 -2.4 -2.0 -1.1 .2 -1.8 -1.9 -1.9 -1.0 -2.8 -3.2 -3.3 -3.8 -3.4 -2.9 -2.2 -2.4 -3.1 -2.7 -1.9 -1.8 -1.7 -1.4 -1.7 -1.9 -1.9 -2.0 -2.0 -2.2 -2.4
-2.2 -2.1 -2.1 -2.1 -2.2 -2.1 -2.2 -2.6 [illegible] [illegible] -1.4 -1.4 .2 .2 -.5 -1.7 -3.9 -4.1 -5.0 -4.7 -4.2 -3.8 -3.5 -2.4 -2.9 -3.2 -2.8 -2.4 -1.8 -2.0 -2.2 -2.2 -2.1 -2.0 -2.2 -2.2
-2.7 -2.0 -3.1 -2.1 -2.2 -2.2 -2.3 -2.5 -3.0 -2.6 -2.3 -2.0 -2.7 -1.8 -4.3 -5.2 -5.7 -4.7 -4.8 -4.6 -3.6 -3.6 -4.2 -4.5 -4.4 -2.6 -2.1 -1.8 -1.4 -1.2 -1.2 -.9 -1.2 -1.7 -1.3 -1.8
-3.6 -3.9 -4.0 -4.0 -4.3 -5.0 -4.1 -3.0 -2.4 -2.5 -2.7 -1.9 -3.4 -3.5 -2.6 -2.4 -2.1 -2.0 -3.8 -3.8 -4.2 -3.6 -3.1 -2.1 -2.2 -1.7 -2.0 -2.5 -2.4 -1.5 -1.1 -1.5 -2.0 -3.7 -3.7 -3.6
-4.3 -6.1 -6.2 -5.8 -4.3 -3.6 -4.1 -3.9 -2.3 -2.0 -3.0 -2.7 -2.7 -1.7 -2.1 -.1 .0 -1.5 -2.9 -3.9 -3.5 -3.7 -2.7 -1.7 -3.0 -3.4 -1.8 -.4 .1 -.1 -.6 -1.9 -3.2 -4.7 -4.1 -5.0
-5.5 -5.9 -6.3 -4.3 -1.9 -.3 -1.5 -3.5 -3.5 -2.8 -1.7 -1.3 -1.2 -1.0 -2.7 -.2 -.1 -1.2 -1.2 -1.3 -1.1 .0 -.1 -1.3 -3.1 -3.7 -.1 -1.1 -2.3 -.7 -.4 -.1 -3.0 -3.9 -2.2 -4.5
1.1 1.0 .5 1.1 1.7 .1 -.3 -1.3 -2.7 .9 .7 1.6 1.8 .2 .6 2.1 1.1 .1 -.1 .3 1.2 2.3 .7 1.9 1.7 2.8 2.4 .0 .8 1.1 1.1 .5 .8 .9 1.2 .9
2.9 1.8 2.1 1.4 .1 -2.0 -1.9 -.4 .2 -.1 -.1 .1 -.1 .7 2.0 2.6 2.2 .2 -1.1 -.5 2.6 4.1 2.5 2.5 2.8 3.1 2.4 -.3 -.9 -.8 -5.0 -2.1 .9 2.7 3.2 3.3
3.7 3.1 2.3 1.6 .9 -1.8 -1.1 -.3 .7 -1.8 -4.9 -4.4 -3.9 -2.0 -2.5 -5.1 -6.5 -6.8 -7.5 -6.2 -2.5 1.5 3.0 2.1 1.3 -1.0 -6.5 -8.9 -6.4 -9.7 -7.1 -6.6 -6.7 -3.0 1.2 2.0
2.0 .5 -.6 -1.8 -2.3 -3.9 -2.9 -3.9 -2.5 -.8 -8.5 -10.7 -11.7 -11.0 -2.8 1.0 1.9 -.3 -3.1 -13.3 -11.6 -6.2 -.5 -2.1 -2.5 -2.6 -4.0 -9.1 -11.5 -10.7 -8.3 -10.4 -9.9 -6.0 -3.1 -1.3
-5.6 -4.4 -6.5 -5.8 -3.0 .1 .7 -.5 1.0 1.8 -3.5 -7.3 -10.0 -5.5 -.8 2.4 2.7 2.4 1.1 -8.9 -9.1 -6.4 -3.9 -1.3 -.9 -2.4 -2.5 -2.9 -4.3 -6.1 -11.8 -8.6 -5.4 -9.0 -9.9 -9.2
-4.8 -4.1 -3.6 -3.0 .1 1.0 2.3 2.5 2.9 2.8 3.0 -.1 -4.6 -2.4 -1.3 -.4 1.7 2.4 2.1 -.7 -4.3 -1.0 -.2 1.3 2.9 3.2 2.7 .5 .2 -3.7 -2.9 -.8 -1.6 .7 -.8 -1.1
-2.5 -3.2 -2.1 -2.6 -1.1 -.3 .1 1.3 1.6 1.3 1.5 -1.7 -1.8 -.6 -1.5 -1.8 -1.2 -.6 1.3 1.9 -.6 -.3 -1.4 .4 1.6 1.7 1.8 2.1 1.0 1.2 .0 -.2 -2.0 -2.8 -.7 .7
-1.6 -2.0 -1.5 -2.7 -2.6 -2.2 -1.7 -2.1 -1.6 -1.2 -1.7 -1.9 -1.8 -1.2 -.9 -2.2 -1.1 -1.5 -1.6 -1.4 -1.1 -.6 -1.9 -2.9 -2.4 -1.6 -1.3 -1.0 -1.2 -.7 .0 -.1 -.5 -.7 -1.5 -1.4
-2.6 -1.7 -2.8 -2.4 -2.8 -3.4 -3.1 -3.4 -3.1 -2.7 -3.1 -3.2 -3.2 -2.7 -2.8 -2.7 -2.6 -3.9 -3.0 -3.3 -2.9 -2.9 -2.8 -3.3 -3.3 -3.4 -3.7 -2.9 -2.9 -3.1 -3.2 -2.5 -2.5 -2.6 -2.5 -2.7
-3.7 -3.4 -4.1 -4.1 -3.6 -3.1 -3.1 -3.2 -3.4 -2.6 -2.1 -3.0 -3.3 -2.8 -2.5 -2.9 -3.2 -3.8 -4.1 -3.8 -3.3 -2.7 -2.6 -3.1 -3.7 -4.4 -3.0 -2.6 -2.3 -2.9 -3.4 -3.2 -2.8 -3.1 -3.8 -3.8
-3.7 -3.3 -3.4 -3.9 -3.7 -3.5 -4.1 -5.1 -5.4 -4.1 -4.5 -4.3 -4.1 -3.3 -2.6 -2.2 -1.5 -.3 -.2 .2 .5 .9 1.5 1.3 .5 .3 2.1 2.8 1.4 1.7 1.6 1.4 .5 .0 -2.7 -4.7
-2.8 -3.2 -3.0 -2.0 -1.9 -2.0 -2.3 -1.7 -1.5 -2.3 -2.9 -3.3 -2.6 -1.9 -1.1 -.7 .0 .7 1.1 1.5 1.6 1.5 2.1 3.0 3.4 4.0 3.3 3.0 2.5 2.0 1.3 .9 .2 -.4 -2.2 -2.7

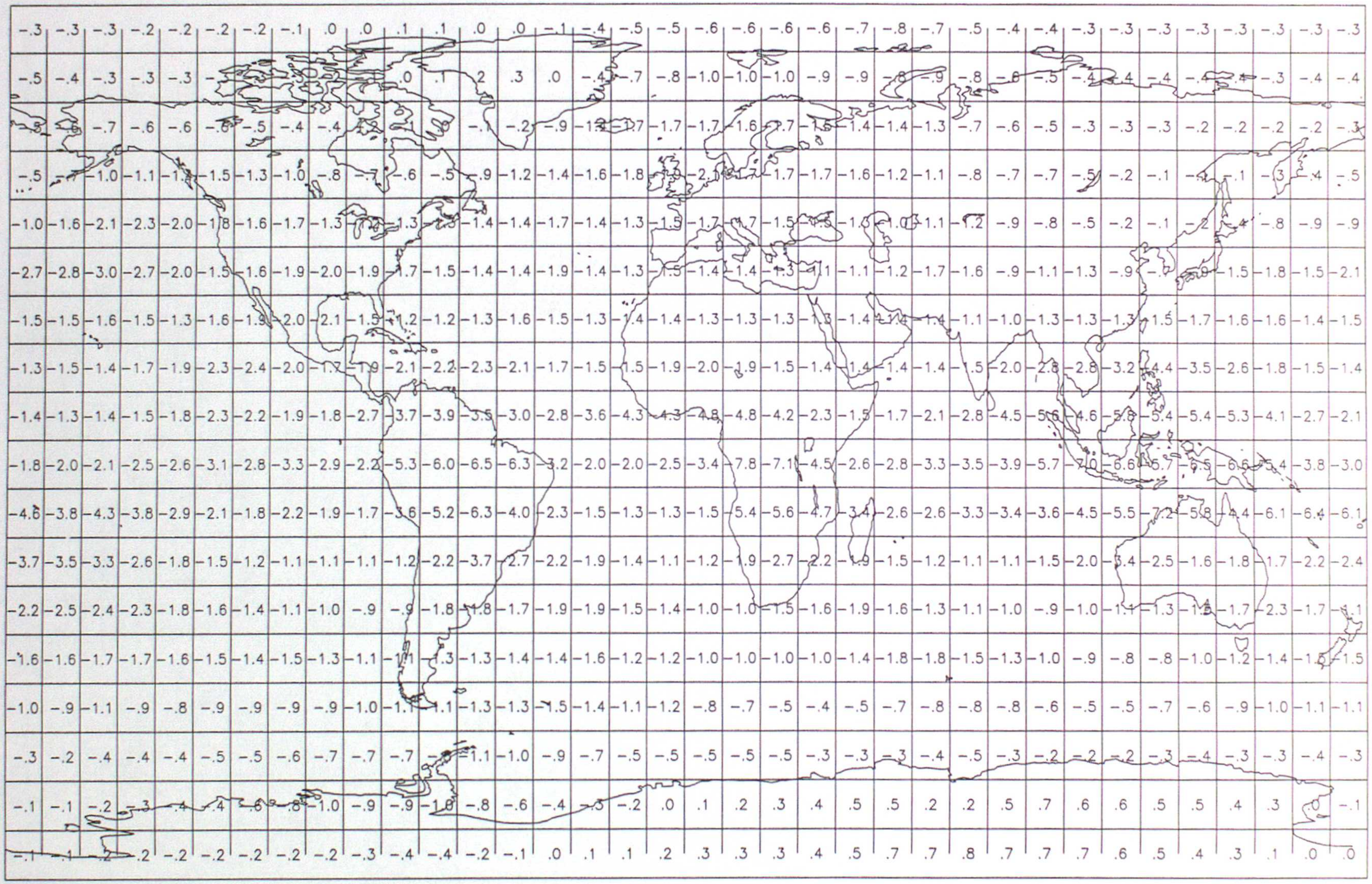
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
MARCH 2000 : HIRS11 channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 31



2.0	1.9	2.0	2.1	2.0	2.0	2.0	2.0	3.0	4.0	4.7	3.4	3.3	3.4	3.8	4.2	3.7	3.5	4.5	5.0	4.3	3.8	4.5	4.8	4.0	3.1	3.1	3.1	2.3	2.1	2.0	2.1	2.0	2.1	2.2	2.2
2.1	1.8	1.7	1.7	1.9	2.0	[illegible]	[illegible]	[illegible]	3.7	4.1	3.2	2.8	3.1	3.5	4.3	4.6	4.4	5.4	6.1	5.4	5.1	5.0	4.7	5.5	5.7	4.3	3.1	2.6	2.4	2.4	2.3	2.3	2.3	2.5	2.7
4.0	4.2	4.9	4.9	4.1	3.6	3.1	2.9	3.7	7.2	3.1	3.1	3.8	4.9	5.7	6.6	7.4	6.8	6.7	6.9	7.7	6.3	5.8	6.2	6.1	4.4	4.0	3.9	3.1	2.6	2.7	3.0	3.2	3.0	3.2	3.4
5.0	6.0	6.1	6.0	6.8	6.5	6.0	4.9	4.4	3.8	3.6	3.6	5.2	5.5	5.5	5.6	5.5	6.9	6.4	6.4	6.8	6.4	6.3	5.3	5.7	5.1	5.5	5.7	5.1	4.5	3.4	3.6	4.5	5.9	5.1	4.1
7.2	9.3	9.0	8.5	7.5	6.7	6.4	7.2	5.6	5.0	5.8	6.5	6.4	6.3	6.6	4.3	4.1	4.9	6.7	7.7	6.9	6.9	7.1	6.1	7.0	7.2	6.5	7.1	6.3	5.7	5.4	5.5	5.2	7.2	6.9	7.1
8.6	9.7	9.6	8.3	6.6	5.0	6.2	8.0	9.0	7.6	6.8	6.6	6.4	6.8	8.5	5.6	5.7	5.5	5.6	6.5	6.0	3.3	5.4	7.0	8.5	9.5	10.3	8.8	6.9	5.3	4.6	5.6	7.3	8.5	6.7	8.3
4.5	4.5	5.6	4.6	3.5	6.0	7.0	7.2	7.9	5.2	3.6	3.9	4.5	6.3	5.7	4.0	4.8	5.2	4.6	4.2	4.1	3.7	4.8	4.3	4.5	2.9	4.4	4.6	4.0	4.1	4.9	5.5	5.2	4.9	3.7	4.8
2.6	4.7	4.6	5.6	6.6	7.6	7.3	6.4	5.6	6.0	6.5	5.4	5.8	4.9	4.4	3.4	3.4	5.8	5.2	4.7	3.7	3.7	2.8	2.4	1.8	3.4	7.1	9.0	8.6	8.9	11.9	9.7	7.6	4.3	3.3	1.8
3.3	3.1	4.0	4.9	6.9	8.5	8.1	6.0	5.8	8.6	9.9	10.8	9.6	8.6	9.4	11.8	12.5	12.8	13.9	13.5	13.9	7.8	3.0	4.3	6.0	8.2	11.6	12.1	10.7	11.7	11.9	11.2	12.3	10.6	8.4	6.9
6.0	6.6	7.9	8.8	9.4	10.4	9.9	10.5	9.6	6.2	11.4	12.9	12.9	14.0	9.6	6.6	7.0	7.5	10.2	16.5	15.4	12.2	8.1	8.5	9.8	9.7	10.2	11.7	12.5	11.9	11.3	12.1	13.0	15.0	12.4	9.1
13.1	10.5	12.1	11.3	9.3	5.5	4.8	6.3	5.4	4.3	10.6	12.9	13.7	10.6	7.4	3.7	1.9	2.6	3.6	13.5	13.1	12.9	10.6	8.4	9.4	11.0	10.9	9.9	11.4	13.2	14.8	13.2	11.3	14.1	14.5	14.7
11.8	10.1	10.7	9.0	6.0	5.4	3.6	3.1	2.2	2.1	2.3	9.5	12.3	8.8	7.9	7.1	3.9	2.0	2.4	8.5	9.8	8.9	7.1	5.1	3.0	2.9	3.6	5.5	7.1	10.6	7.8	4.4	5.6	5.3	7.8	8.7
9.2	8.9	7.9	8.6	6.9	6.4	5.7	4.5	3.4	3.1	3.5	9.2	8.7	7.5	7.7	7.6	6.2	6.0	3.8	3.4	7.4	7.3	8.1	6.0	4.3	3.3	3.1	3.6	4.3	4.0	5.6	5.6	6.7	7.9	6.5	4.2
6.3	6.4	6.4	7.4	6.3	6.0	6.1	6.5	5.8	5.4	5.8	7.0	7.0	6.9	6.3	7.0	5.9	5.6	5.5	5.2	5.2	4.7	6.6	7.8	8.0	6.8	6.0	5.4	4.9	4.6	4.3	5.0	5.9	6.2	6.4	7.2
5.4	5.4	6.0	5.2	5.5	5.8	5.8	5.8	5.6	5.8	5.9	6.3	6.5	6.5	6.5	5.8	5.4	5.7	4.7	4.9	4.3	4.2	4.8	5.6	5.7	6.3	6.5	5.4	4.9	4.7	5.3	5.4	5.8	5.9	5.6	5.9
3.9	3.6	4.6	4.5	4.0	4.0	4.3	4.4	4.6	4.5	4.8	5.8	6.4	5.8	4.9	3.9	3.6	3.4	3.5	3.5	3.6	3.5	4.0	4.4	4.6	4.8	4.1	4.0	3.7	3.8	3.8	4.4	4.1	4.2	4.3	4.1
3.0	3.2	3.9	4.6	4.9	4.8	5.2	5.9	7.1	6.0	6.1	6.2	4.7	3.9	3.4	4.1	4.2	4.1	3.4	3.1	3.1	2.4	2.1	2.0	2.4	3.0	2.5	2.7	2.1	2.2	2.7	2.5	2.6	3.0	4.5	3.4
3.7	3.6	3.8	4.3	4.5	4.4	4.9	5.1	5.4	5.2	4.9	4.4	3.9	3.6	3.4	3.4	3.9	3.9	3.4	3.2	2.8	2.5	2.8	2.5	2.4	2.5	2.3	2.2	2.1	2.2	2.4	3.0	4.0	5.0	4.8	3.8

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 32
MARCH 2000 : HIRS4 channel (400 hPa)
NOAA–15, USING ALL OBSERVATIONS

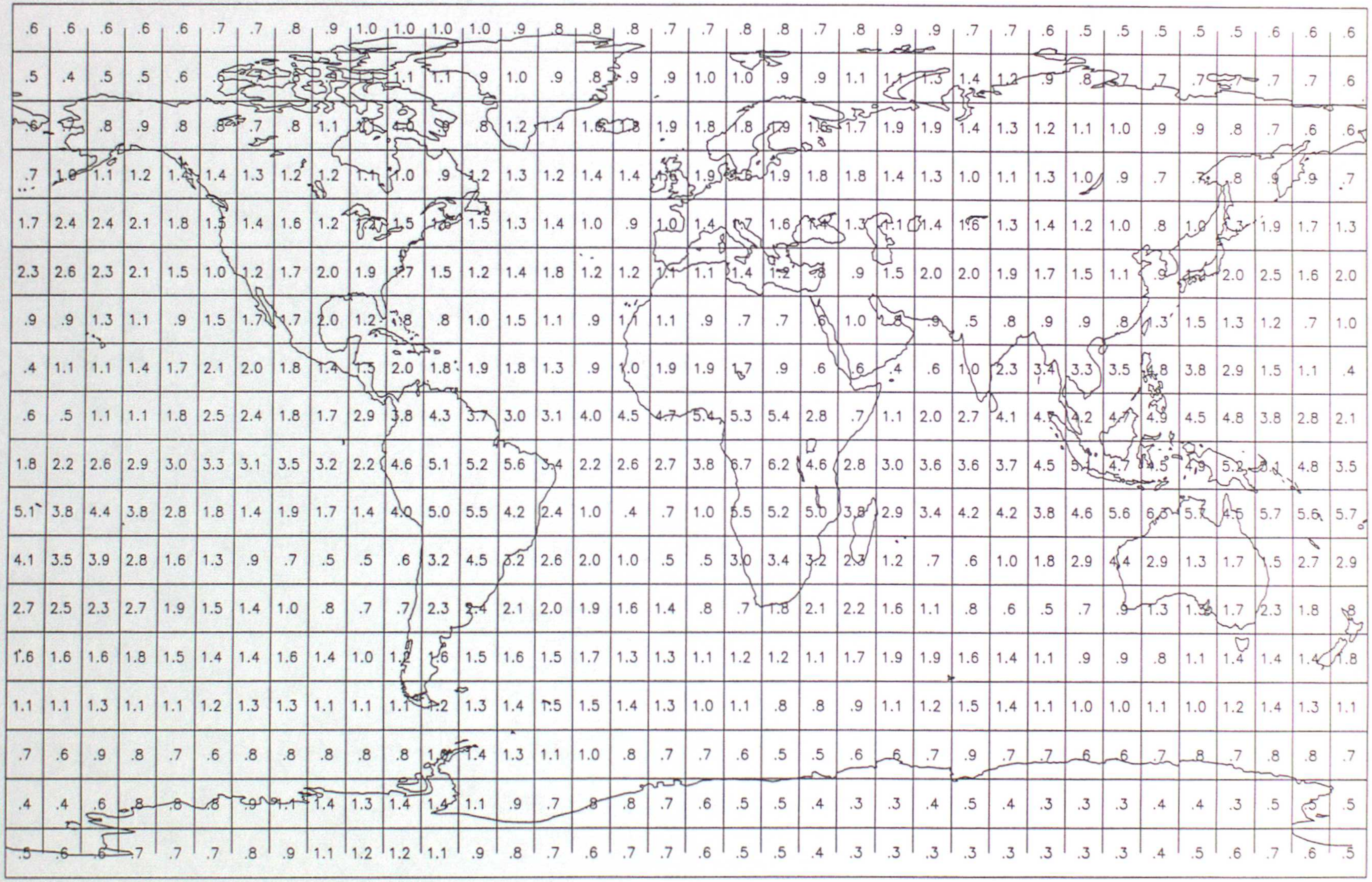

-.3 -.3 -.3 -.2 -.2 -.2 -.2 -.1 .0 .0 .1 .1 .0 .0 -.1 -.4 -.5 -.5 -.6 -.6 -.6 -.6 -.7 -.8 -.7 -.5 -.4 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3
-.5 -.4 -.3 -.3 -.3 .0 .1 .2 .3 .0 -.4 -.7 -.8 -1.0 -1.0 -1.0 -.9 -.9 -.8 -.9 -.8 -.6 -.5 -.4 -.4 -.4 -.4 -.4 -.3 -.4 -.4
-.7 -.6 -.6 -.6 -.5 -.4 -.4 -.1 -.2 -.9 -1.7 -1.7 -1.7 -1.6 -1.7 -1.5 -1.4 -1.4 -1.3 -.7 -.6 -.5 -.3 -.3 -.3 -.2 -.2 -.2 -.2 -.3
-.5 -.7 -1.0 -1.1 -1.2 -1.5 -1.3 -1.0 -.8 -.7 -.6 -.5 -.9 -1.2 -1.4 -1.6 -1.8 -2.1 -1.7 -1.7 -1.7 -1.6 -1.2 -1.1 -.8 -.7 -.7 -.5 -.2 -.1 -.1 -.3 -.4 -.5
-1.0 -1.6 -2.1 -2.3 -2.0 -1.8 -1.6 -1.7 -1.3 -1.3 -1.4 -1.4 -1.7 -1.4 -1.3 -1.5 -1.7 -1.7 -1.5 -1.0 -1.1 -1.2 -.9 -.8 -.5 -.2 -.1 -.2 -.4 -.8 -.9 -.9
-2.7 -2.8 -3.0 -2.7 -2.0 -1.5 -1.6 -1.9 -2.0 -1.9 -1.7 -1.5 -1.4 -1.4 -1.9 -1.4 -1.3 -1.5 -1.4 -1.4 -1.3 -1.1 -1.1 -1.2 -1.7 -1.6 -.9 -1.1 -1.3 -.9 -1.5 -1.8 -1.5 -2.1
-1.5 -1.5 -1.6 -1.5 -1.3 -1.6 -1.9 -2.0 -2.1 -1.5 -1.2 -1.2 -1.3 -1.6 -1.5 -1.3 -1.4 -1.4 -1.3 -1.3 -1.3 -1.3 -1.4 -1.4 -1.4 -1.1 -1.0 -1.3 -1.3 -1.3 -1.5 -1.7 -1.6 -1.6 -1.4 -1.5
-1.3 -1.5 -1.4 -1.7 -1.9 -2.3 -2.4 -2.0 -1.7 -1.9 -2.1 -2.2 -2.3 -2.1 -1.7 -1.5 -1.5 -1.9 -2.0 -1.9 -1.5 -1.4 -1.4 -1.4 -1.4 -1.5 -2.0 -2.8 -2.8 -3.2 -4.4 -3.5 -2.6 -1.8 -1.5 -1.4
-1.4 -1.3 -1.4 -1.5 -1.8 -2.3 -2.2 -1.9 -1.8 -2.7 -3.7 -3.9 -3.5 -3.0 -2.8 -3.6 -4.3 -4.3 -4.8 -4.8 -4.2 -2.3 -1.5 -1.7 -2.1 -2.8 -4.5 -5.6 -4.6 -5.8 -5.4 -5.4 -5.3 -4.1 -2.7 -2.1
-1.8 -2.0 -2.1 -2.5 -2.6 -3.1 -2.8 -3.3 -2.9 -2.2 -5.3 -6.0 -6.5 -6.3 -3.2 -2.0 -2.0 -2.5 -3.4 -7.8 -7.1 -4.5 -2.6 -2.8 -3.3 -3.5 -3.9 -5.7 -7.0 -6.6 -5.7 -6.5 -6.6 -5.4 -3.8 -3.0
-4.6 -3.8 -4.3 -3.8 -2.9 -2.1 -1.8 -2.2 -1.9 -1.7 -3.6 -5.2 -6.3 -4.0 -2.3 -1.5 -1.3 -1.3 -1.5 -5.4 -5.6 -4.7 -3.4 -2.6 -2.6 -3.3 -3.4 -3.6 -4.5 -5.5 -7.2 -5.8 -4.4 -6.1 -6.4 -6.1
-3.7 -3.5 -3.3 -2.6 -1.8 -1.5 -1.2 -1.1 -1.1 -1.1 -1.2 -2.2 -3.7 -2.7 -2.2 -1.9 -1.4 -1.1 -1.2 -1.9 -2.7 -2.2 -1.9 -1.5 -1.2 -1.1 -1.1 -1.5 -2.0 -3.4 -2.5 -1.6 -1.8 -1.7 -2.2 -2.4
-2.2 -2.5 -2.4 -2.3 -1.8 -1.6 -1.4 -1.1 -1.0 -.9 -.9 -1.8 -1.8 -1.7 -1.9 -1.9 -1.5 -1.4 -1.0 -1.0 -1.5 -1.6 -1.9 -1.6 -1.3 -1.1 -1.0 -.9 -1.0 -1.1 -1.3 -1.7 -2.3 -1.7 -1.1
-1.6 -1.6 -1.7 -1.7 -1.6 -1.5 -1.4 -1.5 -1.3 -1.1 -1.1 -1.3 -1.3 -1.4 -1.4 -1.6 -1.2 -1.2 -1.0 -1.0 -1.0 -1.0 -1.4 -1.8 -1.8 -1.5 -1.3 -1.0 -.9 -.8 -.8 -1.0 -1.2 -1.4 -1.5 -1.5
-1.0 -.9 -1.1 -.9 -.8 -.9 -.9 -.9 -.9 -1.0 -1.1 -1.1 -1.3 -1.3 -1.5 -1.4 -1.1 -1.2 -.8 -.7 -.5 -.4 -.5 -.7 -.8 -.8 -.8 -.6 -.5 -.5 -.7 -.6 -.9 -1.0 -1.1 -1.1
-.3 -.2 -.4 -.4 -.4 -.5 -.5 -.6 -.7 -.7 -.7 -1.1 -1.0 -.9 -.7 -.5 -.5 -.5 -.5 -.5 -.3 -.3 -.3 -.4 -.5 -.3 -.2 -.2 -.2 -.3 -.4 -.3 -.3 -.4 -.3
-.1 -.1 -.2 -.3 -.4 -.4 -.6 -.8 -1.0 -.9 -.9 -1.0 -.8 -.6 -.4 -.3 -.2 .0 .1 .2 .3 .4 .5 .5 .2 .2 .5 .7 .6 .6 .5 .5 .4 .3 .0 -.1
-.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.4 -.4 -.2 -.1 .0 .1 .1 .2 .3 .2 .3 .3 .3 .4 .5 .7 .7 .8 .7 .7 .7 .6 .5 .4 .3 .1 .0 .0

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

FIGURE 33

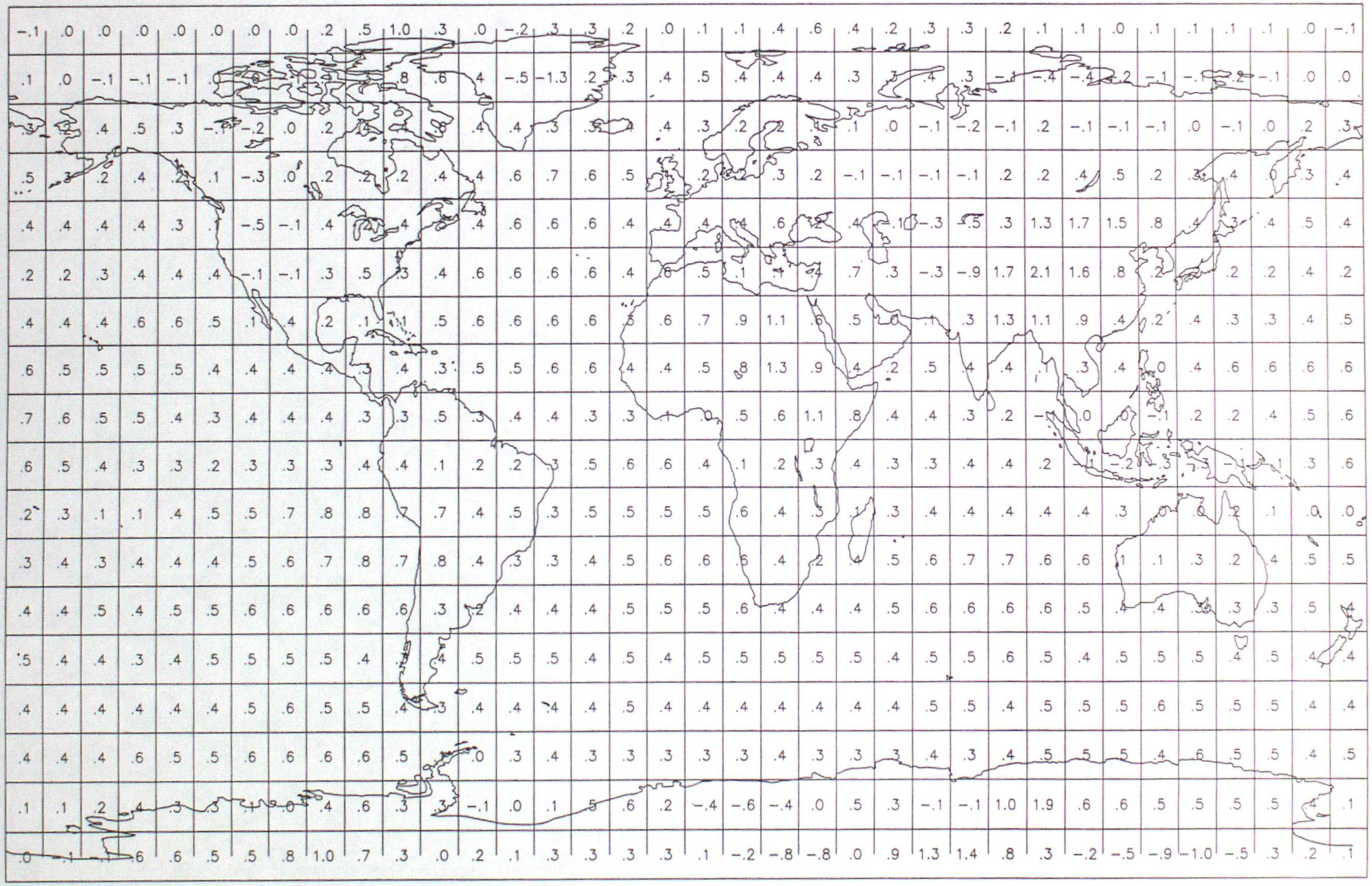
MARCH 2000 : HIRS4 channel (400 hPa)

NOAA-15, USING ALL OBSERVATIONS


.6 .6 .6 .6 .6 .7 .7 .8 .9 1.0 1.0 1.0 1.0 .9 .8 .8 .8 .7 .7 .8 .8 .7 .8 .9 .9 .7 .7 .6 .5 .5 .5 .5 .5 .6 .6 .6
.5 .4 .5 .5 .6 .6 .7 .8 .9 [illegible] 1.1 1.1 .9 1.0 .9 .8 .9 .9 1.0 1.0 .9 .9 1.1 1.1 1.3 1.4 1.2 .9 .8 .7 .7 .7 .7 .7 .7 .6
.6 1.7 .8 .9 .8 .8 .7 .8 1.1 [illegible] 1.0 .8 .8 1.2 1.4 1.6 1.8 1.9 1.8 1.8 1.9 1.6 1.7 1.9 1.9 1.4 1.3 1.2 1.1 1.0 .9 .9 .8 .7 .6 .6
.7 1.0 1.1 1.2 1.4 1.4 1.3 1.2 1.2 1.1 1.0 .9 1.2 1.3 1.2 1.4 1.4 1.6 1.9 1.6 1.9 1.8 1.8 1.4 1.3 1.0 1.1 1.3 1.0 .9 .7 .7 .8 .9 .9 .7
1.7 2.4 2.4 2.1 1.8 1.5 1.4 1.6 1.2 1.2 1.5 1.6 1.5 1.3 1.4 1.0 .9 1.0 1.4 1.7 1.6 1.4 1.3 1.1 1.4 1.6 1.3 1.4 1.2 1.0 .8 1.0 1.3 1.9 1.7 1.3
2.3 2.6 2.3 2.1 1.5 1.0 1.2 1.7 2.0 1.9 1.7 1.5 1.2 1.4 1.8 1.2 1.2 1.1 1.1 1.4 1.2 .8 .9 1.5 2.0 2.0 1.9 1.7 1.5 1.1 .9 [illegible] 2.0 2.5 1.6 2.0
.9 .9 1.3 1.1 .9 1.5 1.7 1.7 2.0 1.2 .8 .8 1.0 1.5 1.1 .9 1.1 1.1 .9 .7 .7 .6 1.0 .8 .9 .5 .8 .9 .9 .8 1.3 1.5 1.3 1.2 .7 1.0
.4 1.1 1.1 1.4 1.7 2.1 2.0 1.8 1.4 1.5 2.0 1.8 1.9 1.8 1.3 .9 1.0 1.9 1.9 1.7 .9 .6 .6 .4 .6 1.0 2.3 3.4 3.3 3.5 4.8 3.8 2.9 1.5 1.1 .4
.6 .5 1.1 1.1 1.8 2.5 2.4 1.8 1.7 2.9 3.8 4.3 3.7 3.0 3.1 4.0 4.5 4.7 5.4 5.3 5.4 2.8 .7 1.1 2.0 2.7 4.1 4.5 4.2 4.7 4.9 4.5 4.8 3.8 2.8 2.1
1.8 2.2 2.6 2.9 3.0 3.3 3.1 3.5 3.2 2.2 4.6 5.1 5.2 5.6 3.4 2.2 2.6 2.7 3.8 6.7 6.2 4.6 2.8 3.0 3.6 3.6 3.7 4.5 5.1 4.7 4.5 4.9 5.2 3.1 4.8 3.5
5.1 3.8 4.4 3.8 2.8 1.8 1.4 1.9 1.7 1.4 4.0 5.0 5.5 4.2 2.4 1.0 .4 .7 1.0 5.5 5.2 5.0 3.8 2.9 3.4 4.2 4.2 3.8 4.6 5.6 6.3 5.7 4.5 5.7 5.6 5.7
4.1 3.5 3.9 2.8 1.6 1.3 .9 .7 .5 .5 .6 3.2 4.5 3.2 2.6 2.0 1.0 .5 .5 3.0 3.4 3.2 2.3 1.2 .7 .6 1.0 1.8 2.9 4.4 2.9 1.3 1.7 1.5 2.7 2.9
2.7 2.5 2.3 2.7 1.9 1.5 1.4 1.0 .8 .7 .7 2.3 2.4 2.1 2.0 1.9 1.6 1.4 .8 .7 1.8 2.1 2.2 1.6 1.1 .8 .6 .5 .7 .9 1.3 1.3 1.7 2.3 1.8 .8
1.6 1.6 1.6 1.8 1.5 1.4 1.4 1.6 1.4 1.0 1.2 1.6 1.5 1.6 1.5 1.7 1.3 1.3 1.1 1.2 1.2 1.1 1.7 1.9 1.9 1.6 1.4 1.1 .9 .9 .8 1.1 1.4 1.4 1.4 1.8
1.1 1.1 1.3 1.1 1.1 1.2 1.3 1.3 1.1 1.1 1.1 1.2 1.3 1.4 1.5 1.5 1.4 1.3 1.0 1.1 .8 .8 .9 1.1 1.2 1.5 1.4 1.1 1.0 1.0 1.1 1.0 1.2 1.4 1.3 1.1
.7 .6 .9 .8 .7 .6 .8 .8 .8 .8 .8 1.0 1.4 1.3 1.1 1.0 .8 .7 .7 .6 .5 .5 .6 .6 .7 .9 .7 .7 .6 .6 .7 .8 .7 .8 .8 .7
.4 .4 .6 .8 .8 .8 .9 1.1 1.4 1.3 1.4 1.4 1.1 .9 .7 .8 .8 .7 .6 .5 .5 .4 .3 .3 .4 .5 .4 .3 .3 .3 .4 .4 .3 .5 .5 .5
.5 .6 .6 .7 .7 .7 .8 .9 1.1 1.2 1.2 1.1 .9 .8 .7 .6 .7 .7 .6 .5 .5 .4 .3 .3 .3 .3 .3 .3 .3 .4 .5 .6 .7 .6 .5

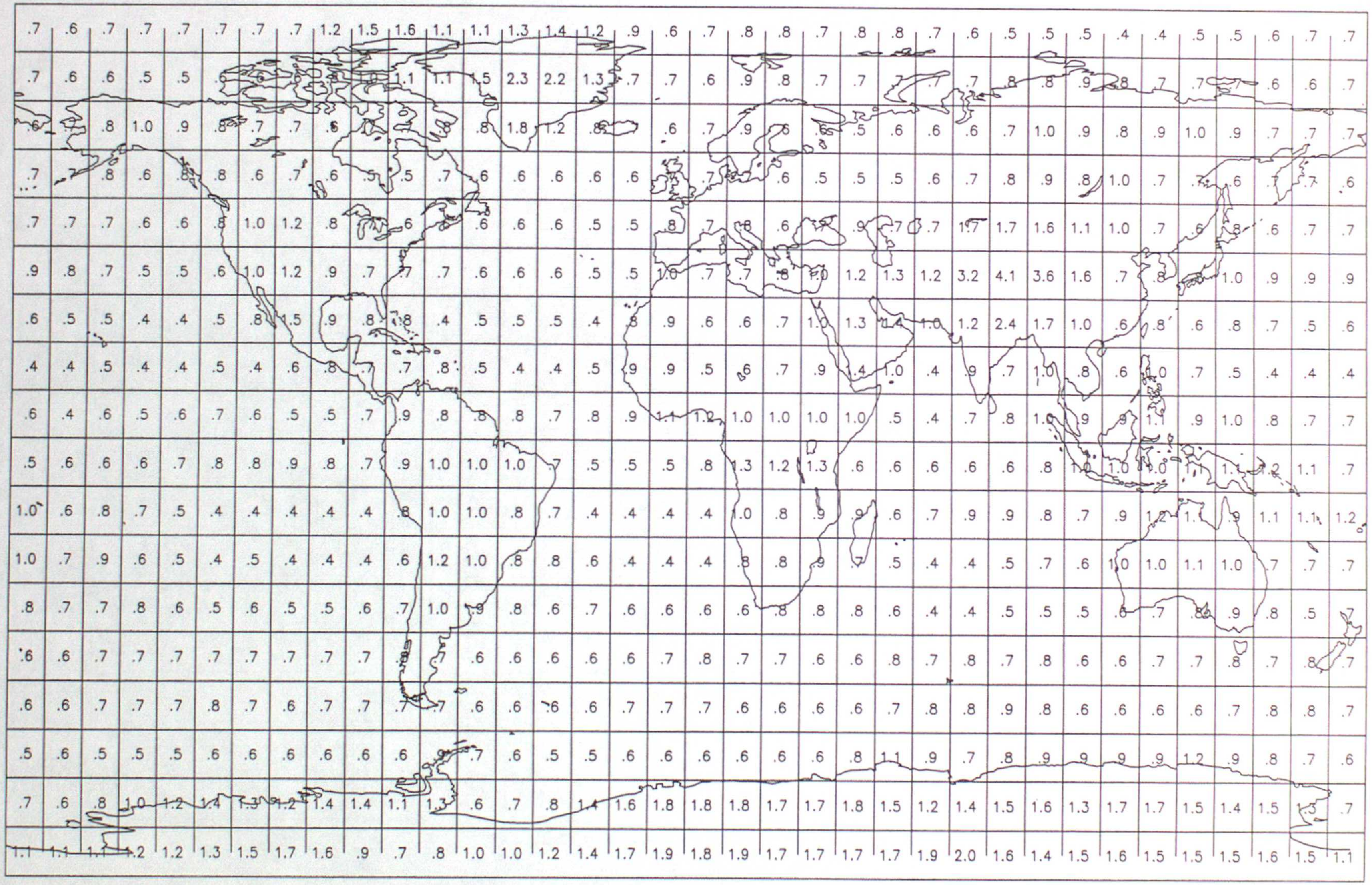
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
MARCH 2000 : AMSUA-5 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 34


-.1 .0 .0 .0 .0 .0 .0 .0 .2 .5 1.0 .3 .0 -.2 .3 .3 .2 .0 .1 .1 .4 .6 .4 .2 .3 .3 .2 .1 .1 .0 .1 .1 .1 .1 .0 -.1
.1 .0 -.1 -.1 -.1 .0 [illegible] .1 [illegible] [illegible] .8 .6 .4 -.5 -1.3 .2 .3 .4 .5 .4 .4 .4 .3 .3 .4 .3 -.1 -.4 -.4 .2 -.1 -.1 .2 -.1 .0 .0
.3 .2 .4 .5 .3 -.1 -.2 .0 .2 .4 .4 .8 .4 .4 .3 .3 .4 .4 .3 .2 .2 .1 .1 .0 -.1 -.2 -.1 .2 -.1 -.1 -.1 .0 -.1 .0 .2 .3
.5 .3 .2 .4 .2 .1 -.3 .0 .2 .2 .2 .4 .4 .6 .7 .6 .5 [illegible] .2 .2 .3 .2 -.1 -.1 -.1 -.1 .2 .2 .4 .5 .2 .3 .4 .0 .3 .4
.4 .4 .4 .4 .3 .1 -.5 -.1 .4 .2 .4 [illegible] .4 .6 .6 .6 .4 .4 .4 .4 .6 .2 .4 -.1 -.3 -.5 .3 1.3 1.7 1.5 .8 .4 .3 .4 .5 .4
.2 .2 .3 .4 .4 .4 -.1 -.1 .3 .5 .3 .4 .6 .6 .6 .6 .4 .6 .5 .1 .4 .4 .7 .3 -.3 -.9 1.7 2.1 1.6 .8 .2 [illegible] .2 .2 .4 .2
.4 .4 .4 .6 .6 .5 .1 .4 .2 .1 .1 .5 .6 .6 .6 .6 .5 .6 .7 .9 1.1 .6 .5 .0 .1 .3 1.3 1.1 .9 .4 .2 .4 .3 .3 .4 .5
.6 .5 .5 .5 .5 .4 .4 .4 .4 .3 .4 .3 .5 .5 .6 .6 .4 .4 .5 .8 1.3 .9 .4 .2 .5 .4 .4 .1 .3 .4 .0 .4 .6 .6 .6 .6
.7 .6 .5 .5 .4 .3 .4 .4 .4 .3 .3 .5 .3 .4 .4 .3 .3 .1 .0 .5 .6 1.1 .8 .4 .4 .3 .2 -.1 .0 .0 -.1 .2 .2 .4 .5 .6
.6 .5 .4 .3 .3 .2 .3 .3 .3 .4 .4 .1 .2 .2 .3 .5 .6 .6 .4 .1 .2 .3 .4 .3 .3 .4 .4 .2 -.1 -.2 -.3 .3 -.1 .1 .3 .6
.2 .3 .1 .1 .4 .5 .5 .7 .8 .8 .7 .7 .4 .5 .3 .5 .5 .5 .5 .6 .4 .3 .1 .3 .4 .4 .4 .4 .4 .3 .0 .0 .2 .1 .0 .0
.3 .4 .3 .4 .4 .4 .5 .6 .7 .8 .7 .8 .4 .3 .3 .4 .5 .6 .6 .6 .4 .2 .4 .5 .6 .7 .7 .6 .6 .1 .1 .3 .2 .4 .5 .5
.4 .4 .5 .4 .5 .5 .6 .6 .6 .6 .6 .3 .2 .4 .4 .4 .5 .5 .5 .6 .4 .4 .4 .5 .6 .6 .6 .6 .5 .4 .4 .3 .3 .3 .5 .4
.5 .4 .4 .3 .4 .5 .5 .5 .5 .4 .3 .4 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .4 .5 .5 .6 .5 .4 .5 .5 .5 .4 .5 .4 .4
.4 .4 .4 .4 .4 .4 .5 .6 .5 .5 .4 .3 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .6 .5 .5 .5 .4 .4
.4 .4 .4 .6 .5 .5 .6 .6 .6 .6 .5 [illegible] .0 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .4 .5 .5 .5 .4 .6 .5 .5 .4 .5
.1 .1 .2 .4 .3 .3 .1 .0 .4 .6 .3 .3 -.1 .0 .1 .5 .6 .2 -.4 -.6 -.4 .0 .5 .3 -.1 -.1 1.0 1.9 .6 .6 .5 .5 .5 .5 .4 .1
.0 -.1 -.1 .6 .6 .5 .5 .8 1.0 .7 .3 .0 .2 .1 .3 .3 .3 .3 .1 -.2 -.8 -.8 .0 .9 1.3 1.4 .8 .3 -.2 -.5 -.9 -1.0 -.5 .3 .2 .1

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
MARCH 2000 : AMSUA-5 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

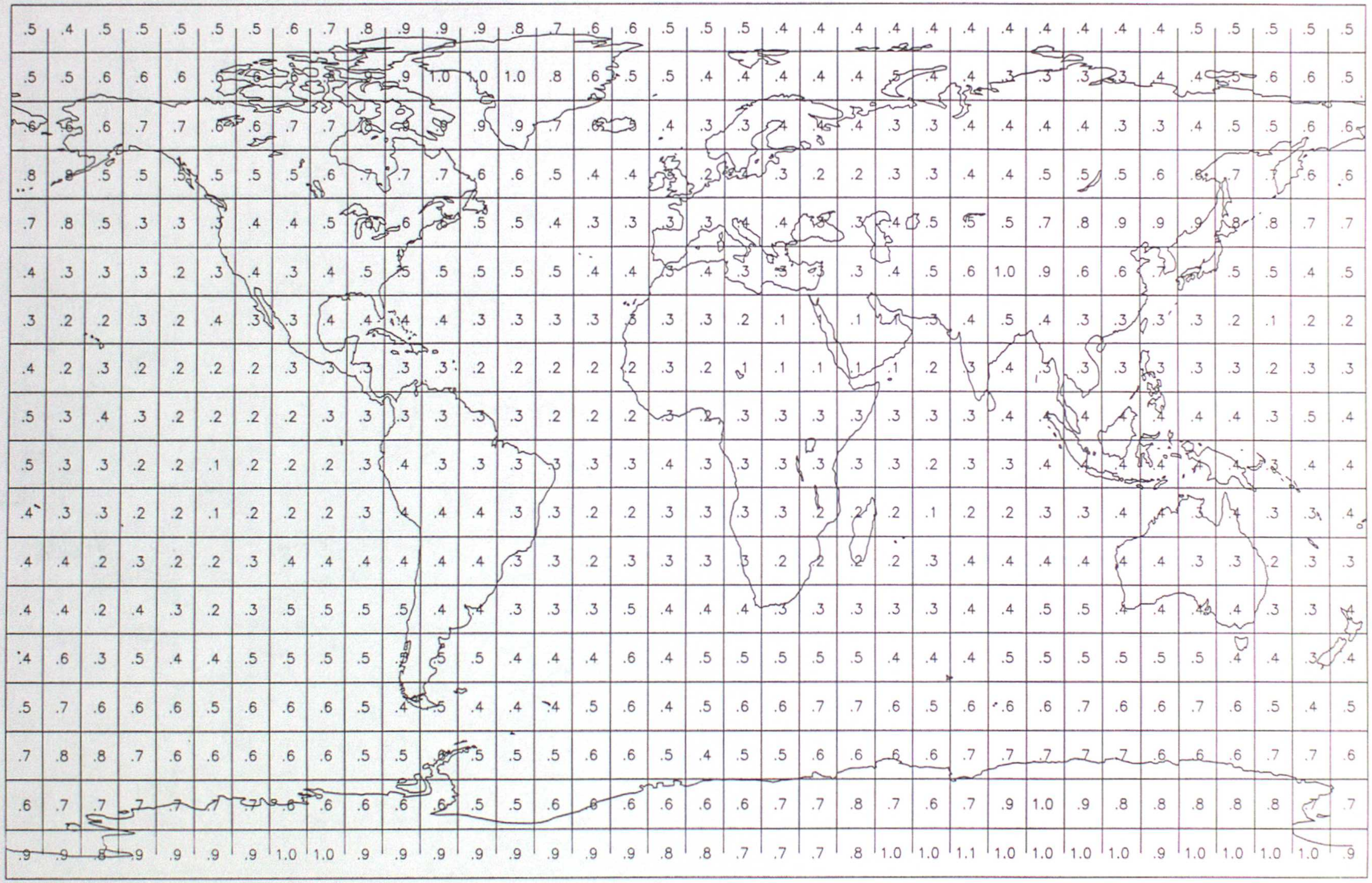
FIGURE 35



.7	.6	.7	.7	.7	.7	.7	.7	1.2	1.5	1.6	1.1	1.1	1.3	1.4	1.2	.9	.6	.7	.8	.8	.7	.8	.8	.7	.6	.5	.5	.5	.4	.4	.5	.5	.6	.7	.7
.7	.6	.6	.5	.5	.6	.6	.6	.8	[illegible]	1.1	1.1	1.5	2.3	2.2	1.3	.7	.7	.6	.9	.8	.7	.7	.7	.7	.7	.8	.8	.9	.8	.7	.7	.7	.6	.6	.7
.6	.7	.8	1.0	.9	.8	.7	.7	.6	[illegible]	.7	.8	.8	1.8	1.2	.8	[illegible]	.6	.7	.9	.6	.6	.5	.6	.6	.6	.7	1.0	.9	.8	.9	1.0	.9	.7	.7	.7
.7	.7	.8	.6	.8	.8	.6	.7	.6	.5	.5	.7	.6	.6	.6	.6	.6	[illegible]	.7	[illegible]	.6	.5	.5	.5	.6	.7	.8	.9	.8	1.0	.7	.7	.6	.7	.7	.6
.7	.7	.7	.6	.6	.8	1.0	1.2	.8	[illegible]	.6	[illegible]	.6	.6	.6	.5	.5	.8	.7	.8	.6	.7	.9	.7	.7	1.7	1.7	1.6	1.1	1.0	.7	.6	.8	.6	.7	.7
.9	.8	.7	.5	.5	.6	1.0	1.2	.9	.7	.7	.7	.6	.6	.6	.5	.5	1.0	.7	.7	.8	1.0	1.2	1.3	1.2	3.2	4.1	3.6	1.6	.7	.8	[illegible]	1.0	.9	.9	.9
.6	.5	.5	.4	.4	.5	.8	1.5	.9	.8	.8	.4	.5	.5	.5	.4	.8	.9	.6	.6	.7	1.0	1.3	1.4	1.0	1.2	2.4	1.7	1.0	.6	.8	.6	.8	.7	.5	.6
.4	.4	.5	.4	.4	.5	.4	.6	.8	.7	.7	.8	.5	.4	.4	.5	.9	.9	.5	.6	.7	.9	1.4	1.0	.4	.9	.7	1.0	.8	.6	1.0	.7	.5	.4	.4	.4
.6	.4	.6	.5	.6	.7	.6	.5	.5	.7	.9	.8	.8	.8	.7	.8	.9	1.1	1.2	1.0	1.0	1.0	1.0	.5	.4	.7	.8	1.0	.9	.9	1.1	.9	1.0	.8	.7	.7
.5	.6	.6	.6	.7	.8	.8	.9	.8	.7	.9	1.0	1.0	1.0	.7	.5	.5	.5	.8	1.3	1.2	1.3	.6	.6	.6	.6	.6	.8	1.0	1.0	1.0	1.1	1.1	1.2	1.1	.7
1.0	.6	.8	.7	.5	.4	.4	.4	.4	.4	.8	1.0	1.0	.8	.7	.4	.4	.4	.4	1.0	.8	.9	.9	.6	.7	.9	.9	.8	.7	.9	1.2	[illegible]	.9	1.1	1.1	1.2
1.0	.7	.9	.6	.5	.4	.5	.4	.4	.4	.6	1.2	1.0	.8	.8	.6	.4	.4	.4	.8	.8	.9	.7	.5	.4	.4	.5	.7	.6	1.0	1.0	1.1	1.0	.7	.7	.7
.8	.7	.7	.8	.6	.5	.6	.5	.5	.6	.7	1.0	.9	.8	.6	.7	.6	.6	.6	.6	.8	.8	.8	.6	.4	.4	.5	.5	.5	.6	.7	.8	.9	.8	.5	.7
.6	.6	.7	.7	.7	.7	.7	.7	.7	.7	.8	.7	.6	.6	.6	.6	.6	.7	.8	.7	.7	.6	.6	.8	.7	.8	.7	.8	.6	.6	.7	.7	.8	.7	.8	.7
.6	.6	.7	.7	.7	.8	.7	.6	.7	.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.6	.6	.6	.6	.7	.8	.8	.9	.8	.6	.6	.6	.6	.7	.8	.8	.7
.5	.6	.5	.5	.5	.6	.6	.6	.6	.6	.6	.9	.7	.6	.5	.5	.6	.6	.6	.6	.6	.6	.8	1.1	.9	.7	.8	.9	.9	.9	.9	1.2	.9	.8	.7	.6
.7	.6	.8	1.0	1.2	1.4	1.3	1.2	1.4	1.4	1.1	1.3	.6	.7	.8	1.4	1.6	1.8	1.8	1.8	1.7	1.7	1.8	1.5	1.2	1.4	1.5	1.6	1.3	1.7	1.7	1.5	1.4	1.5	1.3	.7
1.1	1.1	1.1	1.2	1.2	1.3	1.5	1.7	1.6	.9	.7	.8	1.0	1.0	1.2	1.4	1.7	1.9	1.8	1.9	1.7	1.7	1.7	1.7	1.9	2.0	1.6	1.4	1.5	1.6	1.5	1.5	1.5	1.6	1.5	1.1

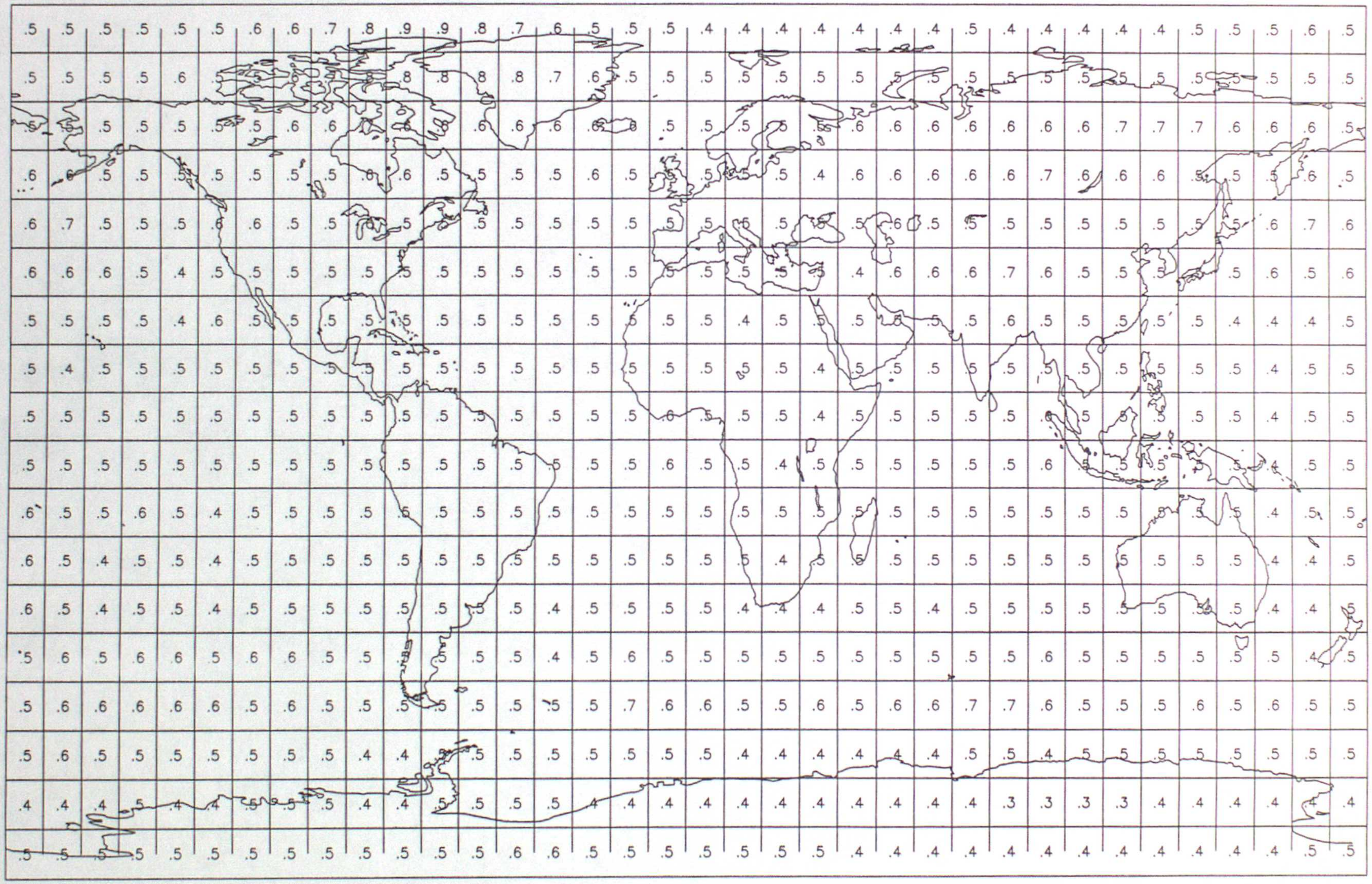
ATOVS : MEAN O−B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
MARCH 2000 : AMSUA−7 Channel (300 hPa)
NOAA−15, USING ALL OBSERVATIONS

FIGURE 36


.5 .4 .5 .5 .5 .5 .5 .6 .7 .8 .9 .9 .9 .8 .7 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5
.5 .5 .6 .6 .6 .6 .6 .6 .8 .9 .9 1.0 1.0 1.0 .8 .6 .5 .5 .4 .4 .4 .4 .4 .5 .4 .4 .3 .3 .3 .3 .4 .4 .5 .6 .6 .5
.6 .6 .6 .7 .7 .6 .6 .7 .7 .8 .8 .8 .9 .9 .7 .6 .5 .4 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .4 .3 .3 .4 .5 .5 .6 .6
.8 .8 .5 .5 .5 .5 .5 .5 .6 .7 .7 .7 .6 .6 .5 .4 .4 .3 .2 .4 .3 .2 .2 .3 .3 .4 .4 .5 .5 .5 .6 .6 .7 .7 .6 .6
.7 .8 .5 .3 .3 .3 .4 .4 .5 .6 .6 .6 .5 .5 .4 .3 .3 .3 .3 .4 .4 .5 .3 .4 .5 .5 .5 .7 .8 .9 .9 .9 .8 .8 .7 .7
.4 .3 .3 .3 .2 .3 .4 .3 .4 .5 .5 .5 .5 .5 .5 .4 .4 .3 .4 .3 .3 .3 .3 .4 .5 .6 1.0 .9 .6 .6 .7 .5 .5 .4 .5
.3 .2 .2 .3 .2 .4 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .2 .1 .1 .1 .1 .3 .4 .5 .4 .3 .3 .3 .3 .2 .1 .2 .2
.4 .2 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .2 .1 .1 .1 .1 .1 .2 .3 .4 .3 .3 .3 .3 .3 .3 .2 .3 .3
.5 .3 .4 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .2 .3 .2 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .5 .4
.5 .3 .3 .2 .2 .1 .2 .2 .2 .3 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .2 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4
.4 .3 .3 .2 .2 .1 .2 .2 .2 .3 .4 .4 .4 .3 .3 .2 .2 .3 .3 .3 .3 .2 .2 .2 .1 .2 .2 .3 .3 .4 .4 .3 .4 .3 .3 .4
.4 .4 .2 .3 .2 .2 .3 .4 .4 .4 .4 .4 .4 .3 .3 .2 .3 .3 .3 .3 .2 .2 .2 .2 .3 .4 .4 .4 .4 .4 .4 .3 .3 .2 .3 .3
.4 .4 .2 .4 .3 .2 .3 .5 .5 .5 .5 .4 .4 .3 .3 .3 .5 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .5 .5 .4 .4 .4 .4 .3 .3 .4
.4 .6 .3 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .6 .4 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .3 .4
.5 .7 .6 .6 .6 .5 .6 .6 .6 .5 .4 .5 .4 .4 .4 .5 .6 .4 .5 .6 .6 .7 .7 .6 .5 .6 .6 .6 .7 .6 .6 .7 .6 .5 .4 .5
.7 .8 .8 .7 .6 .6 .6 .6 .6 .5 .5 .6 .5 .5 .5 .6 .6 .5 .4 .5 .5 .6 .6 .6 .6 .7 .7 .7 .7 .7 .6 .6 .6 .7 .7 .6
.6 .7 .7 .7 .7 .7 .7 .6 .6 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6 .6 .7 .7 .8 .7 .6 .7 .9 1.0 .9 .8 .8 .8 .8 .8 .7 .7
.9 .9 .8 .9 .9 .9 .9 1.0 1.0 .9 .9 .9 .9 .9 .9 .9 .9 .8 .8 .7 .7 .7 .8 1.0 1.0 1.1 1.0 1.0 1.0 1.0 .9 1.0 1.0 1.0 1.0 .9

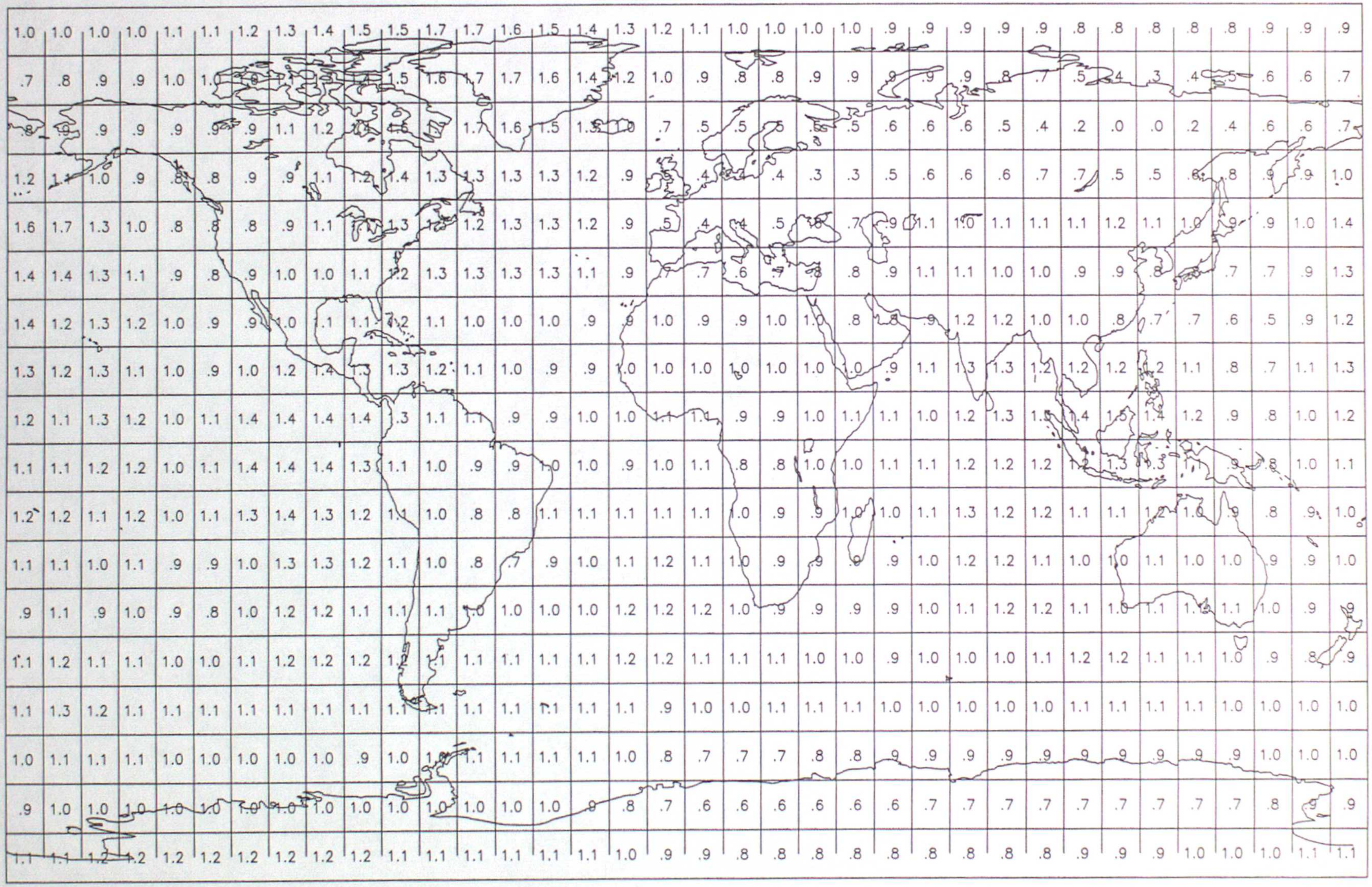
ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
MARCH 2000 : AMSUA–7 channel (300 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 37


.5 .5 .5 .5 .5 .5 .6 .6 .7 .8 .9 .9 .8 .7 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .5 .5 .5 .6 .5
.5 .5 .5 .5 .6 .5 .5 .6 .5 .8 .8 .8 .8 .8 .7 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .8 .6 .6 .6 .6 .8 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .6 .6 .6 .5
.6 .6 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .4 .6 .6 .6 .6 .6 .7 .6 .6 .6 .5 .5 .5 .6 .5
.6 .7 .5 .5 .5 .6 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .7 .6
.6 .6 .6 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .6 .6 .6 .7 .6 .5 .5 .5 .5 .6 .5 .6
.5 .5 .5 .5 .4 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .6 .5 .5 .6 .5 .5 .5 .5 .5 .4 .4 .4 .5
.5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .4 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .4 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .4 .5 .5
.6 .5 .5 .6 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.6 .5 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5
.6 .5 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5
.5 .6 .5 .6 .6 .5 .6 .6 .5 .5 .5 .5 .5 .5 .4 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .4 .5
.5 .6 .6 .6 .6 .6 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .7 .6 .6 .5 .5 .6 .5 .6 .6 .7 .7 .6 .5 .5 .5 .6 .5 .6 .5 .5
.5 .6 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5
.4 .4 .4 .5 .4 .4 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5

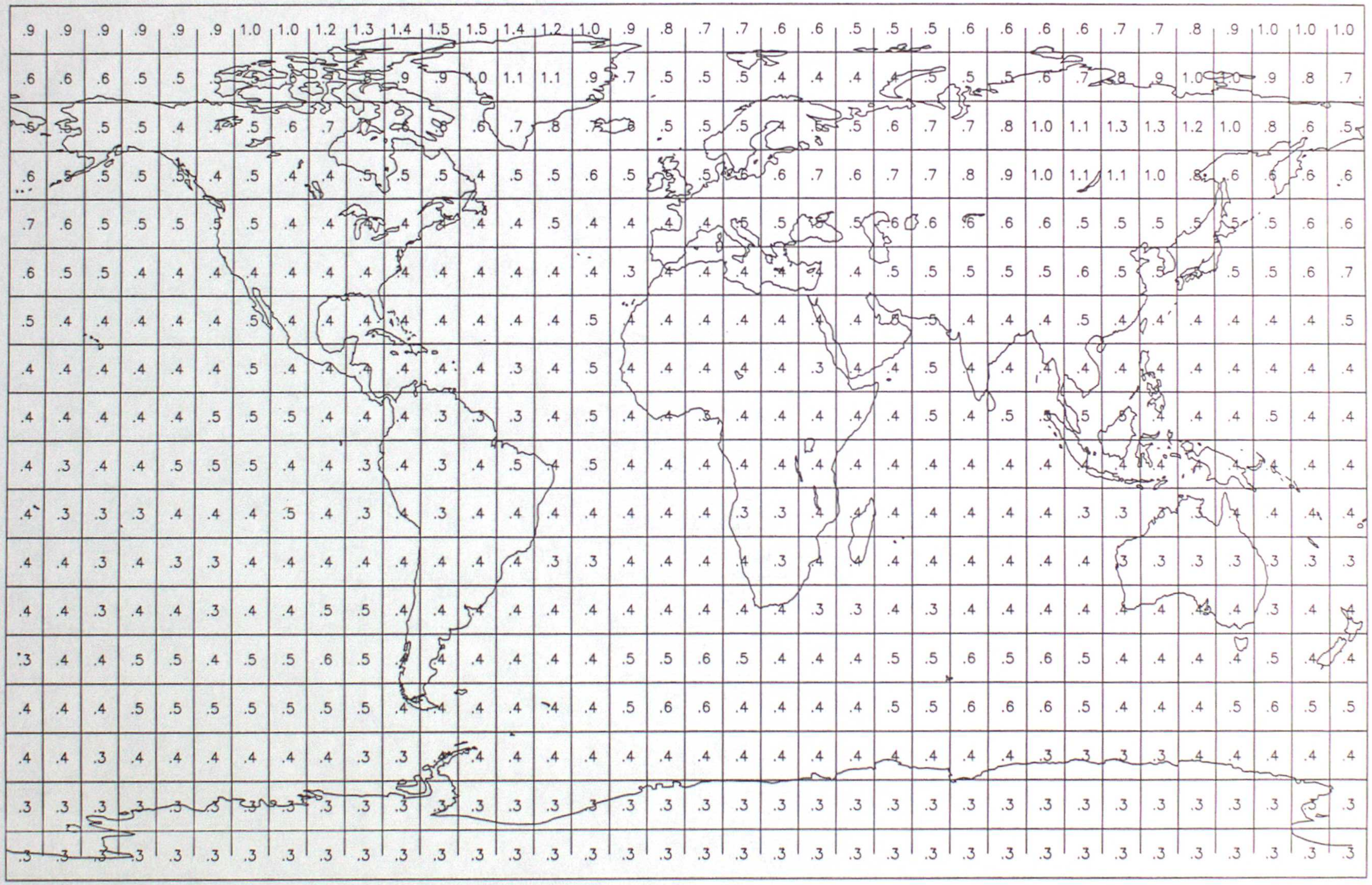
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
MARCH 2000 : AMSUA-9 Channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 38


1.0 1.0 1.0 1.0 1.1 1.1 1.2 1.3 1.4 1.5 1.5 1.7 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .9 .8 .8 .8 .8 .8 .9 .9 .9
.7 .8 .9 .9 1.0 1.0 [illegible] 1.1 [illegible] 1.4 1.5 1.6 1.7 1.7 1.6 1.4 1.2 1.0 .9 .8 .8 .9 .9 .9 .9 .9 .8 .7 .5 .4 .3 .4 .5 .6 .6 .7
.8 .9 .9 .9 .9 .9 .9 1.1 1.2 1.4 1.6 1.7 1.7 1.6 1.5 1.3 1.0 .7 .5 .5 .5 .5 .5 .6 .6 .6 .5 .4 .2 .0 .0 .2 .4 .6 .6 .7
1.2 1.1 1.0 .9 .8 .8 .9 .9 1.1 1.2 1.4 1.3 1.3 1.3 1.3 1.2 .9 .5 .4 .4 .4 .3 .3 .5 .6 .6 .6 .7 .7 .5 .5 .6 .8 .9 .9 1.0
1.6 1.7 1.3 1.0 .8 .8 .8 .9 1.1 1.1 1.3 [illegible] 1.2 1.3 1.3 1.2 .9 .5 .4 .4 .5 .6 .7 .9 1.1 1.0 1.1 1.1 1.1 1.2 1.1 1.0 .9 .9 1.0 1.4
1.4 1.4 1.3 1.1 .9 .8 .9 1.0 1.0 1.1 1.2 1.3 1.3 1.3 1.3 1.1 .9 .7 .7 .6 .7 .8 .8 .9 1.1 1.1 1.0 1.0 .9 .9 .8 .7 .7 .9 1.3
1.4 1.2 1.3 1.2 1.0 .9 .9 1.0 1.1 1.1 1.2 1.1 1.0 1.0 1.0 .9 .9 1.0 .9 .9 1.0 1.0 .8 .8 .9 1.2 1.2 1.0 1.0 .8 .7 .7 .6 .5 .9 1.2
1.3 1.2 1.3 1.1 1.0 .9 1.0 1.2 1.4 1.3 1.3 1.2 1.1 1.0 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 1.1 1.3 1.3 1.2 1.2 1.2 1.2 1.1 .8 .7 1.1 1.3
1.2 1.1 1.3 1.2 1.0 1.1 1.4 1.4 1.4 1.4 1.3 1.1 1.1 .9 .9 1.0 1.0 1.1 1.1 .9 .9 1.0 1.1 1.1 1.0 1.2 1.3 1.5 1.4 1.5 1.4 1.2 .9 .8 1.0 1.2
1.1 1.1 1.2 1.2 1.0 1.1 1.4 1.4 1.4 1.3 1.1 1.0 .9 .9 1.0 1.0 .9 1.0 1.1 .8 .8 1.0 1.0 1.1 1.1 1.2 1.2 1.2 1.2 1.3 1.3 1.1 .9 .8 1.0 1.1
1.2 1.2 1.1 1.2 1.0 1.1 1.3 1.4 1.3 1.2 1.1 1.0 .8 .8 1.1 1.1 1.1 1.1 1.1 1.0 .9 .9 1.0 1.0 1.1 1.3 1.2 1.2 1.1 1.1 1.2 1.0 .9 .8 .9 1.0
1.1 1.1 1.0 1.1 .9 .9 1.0 1.3 1.3 1.2 1.1 1.0 .8 .7 .9 1.0 1.1 1.2 1.1 1.0 .9 .9 .9 .9 1.0 1.2 1.2 1.1 1.0 1.0 1.1 1.0 1.0 .9 .9 1.0
.9 1.1 .9 1.0 .9 .8 1.0 1.2 1.2 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.2 1.2 1.2 1.0 .9 .9 .9 .9 1.0 1.1 1.2 1.2 1.1 1.0 1.1 1.1 1.1 1.0 .9 .9
1.1 1.2 1.1 1.1 1.0 1.0 1.1 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.1 1.1 1.1 1.0 1.0 .9 1.0 1.0 1.0 1.1 1.2 1.2 1.1 1.1 1.0 .9 .8 .9
1.1 1.3 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 .9 1.0 1.0 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0
1.0 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 .9 1.0 1.0 1.1 1.1 1.1 1.1 1.0 .8 .7 .7 .7 .8 .8 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0
.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 .8 .7 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .9 .9
1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.0 .9 .9 .9 .9 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 .9 .9 1.0 1.0 1.0 1.1 1.1

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
MARCH 2000 : AMSUA–9 channel (100 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 39



.9	.9	.9	.9	.9	.9	1.0	1.0	1.2	1.3	1.4	1.5	1.5	1.4	1.2	1.0	.9	.8	.7	.7	.6	.6	.5	.5	.5	.6	.6	.6	.6	.7	.7	.8	.9	1.0	1.0	1.0
.6	.6	.6	.5	.5	.5	.5	.6	[illegible]	.8	.9	.9	1.0	1.1	1.1	.9	.7	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.6	.7	.8	.9	1.0	1.0	.9	.8	.7
.5	.5	.5	.5	.4	.4	.5	.6	.7	.7	.6	.8	.6	.7	.8	.7	.8	.5	.5	.5	.4	.5	.5	.6	.7	.7	.8	1.0	1.1	1.3	1.3	1.2	1.0	.8	.6	.5
.6	.5	.5	.5	.5	.4	.5	.4	.4	.5	.5	.5	.4	.5	.5	.6	.5	.5	.5	.6	.6	.7	.6	.7	.7	.8	.9	1.0	1.1	1.1	1.0	.8	.6	.6	.6	.6
.7	.6	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.5	.5	.5	.5	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.6	.6
.6	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.6	.5	.5		.5	.5	.6	.7
.5	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.5
.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.3	.4	.5	.4	.4	.4	.4	.4	.3	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.5	.5	.5	.4	.4	.4	.3	.3	.3	.4	.5	.4	.4	.3	.4	.4	.4	.4	.4	.5	.4	.5	.5	.5	.5	.4	.4	.4	.5	.4	.4
.4	.3	.4	.4	.5	.5	.5	.4	.4	.3	.4	.3	.4	.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.3	.3	.3	.4	.4	.4	.5	.4	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4
.4	.4	.3	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3
.4	.4	.3	.4	.4	.3	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4
.3	.4	.4	.5	.5	.4	.5	.5	.6	.5	.4	.4	.4	.4	.4	.4	.5	.5	.6	.5	.4	.4	.4	.5	.5	.6	.5	.6	.5	.4	.4	.4	.4	.5	.4	.4
.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.6	.6	.4	.4	.4	.4	.5	.5	.6	.6	.6	.5	.4	.4	.4	.5	.6	.5	.5
.4	.4	.3	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4	.4
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13501	24.9	-22.0	ALL	P	SUR	509	0	0	0.8	0.0	0.8
13502	21.5	-20.4	ALL	P	SUR	202	0	0	0.8	0.1	0.8
13503	13.2	-19.6	ALL	P	SUR	287	0	0	1.0	0.1	1.0
13507	22.7	-21.5	ALL	P	SUR	410	0	0	0.8	-0.1	0.8
13508	18.4	-21.2	ALL	P	SUR	314	0	0	0.8	0.3	0.8
13509	16.8	-20.8	ALL	P	SUR	395	0	0	0.9	0.7	1.1
41520	24.7	-56.8	ALL	P	SUR	289	0	0	0.8	-0.6	1.0
41521	28.6	-66.1	ALL	P	SUR	291	0	0	0.8	-0.1	0.8
41524	18.2	-72.1	ALL	P	SUR	187	0	0	1.2	0.4	1.2
41625	23.7	-73.6	ALL	P	SUR	268	0	0	0.9	0.2	1.0
41630	19.4	-52.6	ALL	P	SUR	259	0	0	0.8	0.0	0.8
41644	25.4	-46.3	ALL	P	SUR	277	0	0	0.9	-0.3	0.9
41651	30.4	-76.3	ALL	P	SUR	299	0	0	1.0	0.9	1.3
41671	25.5	-77.3	ALL	P	SUR	255	0	0	1.0	0.4	1.1
41853	33.9	-68.1	ALL	P	SUR	222	7	3	3.3	4.4	5.5
44546	40.4	-26.1	ALL	P	SUR	35	0	0	1.1	0.8	1.4
44607	52.6	-26.9	ALL	P	SUR	641	1	0	1.4	0.5	1.5
44608	36.7	-17.4	ALL	P	SUR	1587	0	0	0.9	-0.1	0.9
44610	55.6	-33.9	ALL	P	SUR	1662	0	0	1.8	0.1	1.8
44611	41.3	-46.8	ALL	P	SUR	512	0	0	1.2	0.6	1.3
44612	39.7	-38.1	ALL	P	SUR	487	0	0	1.3	0.4	1.4
44613	27.5	-38.1	ALL	P	SUR	784	4	1	1.1	-0.2	1.1
44614	51.0	-12.8	ALL	P	SUR	123	1	1	2.1	0.3	2.1
44615	38.7	-48.2	ALL	P	SUR	490	0	0	1.2	0.3	1.2
44617	44.4	-44.5	ALL	P	SUR	504	0	0	1.5	0.3	1.5
44620	35.5	-45.8	ALL	P	SUR	327	0	0	1.2	0.1	1.2
44621	50.6	-5.1	ALL	P	SUR	101	2	2	1.5	0.5	1.5
44622	47.0	-44.4	ALL	P	SUR	510	0	0	1.4	0.4	1.4
44623	46.5	-38.6	ALL	P	SUR	505	0	0	1.6	0.1	1.6
44626	48.4	-19.9	ALL	P	SUR	1461	7	0	1.0	0.5	1.1
44627	46.7	-31.8	ALL	P	SUR	1409	9	1	1.3	0.3	1.3
44628	39.0	-49.5	ALL	P	SUR	1103	8	1	1.4	-0.2	1.4
44630	49.4	-21.7	ALL	P	SUR	1487	17	1	1.1	0.2	1.1
44657	47.3	-59.9	ALL	P	SUR	106	103	97	3.0	-0.4	3.0
44721	59.5	-6.7	ALL	P	SUR	2074	7	0	1.7	-0.4	1.7
44722	58.6	-6.8	ALL	P	SUR	1502	8	1	1.7	-0.4	1.7
44723	46.3	-36.6	ALL	P	SUR	613	0	0	1.7	0.1	1.7
44724	44.0	-38.9	ALL	P	SUR	488	0	0	1.5	0.6	1.6
44725	43.2	-51.3	ALL	P	SUR	314	0	0	1.1	-0.1	1.2
44726	35.0	-51.3	ALL	P	SUR	321	1	0	1.0	0.1	1.0
44727	35.3	-39.9	ALL	P	SUR	320	0	0	1.3	0.1	1.3
44729	46.2	-44.3	ALL	P	SUR	316	0	0	1.4	0.3	1.4
44765	30.7	-56.1	ALL	P	SUR	537	1	0	1.3	-0.5	1.4
44773	48.2	-41.1	ALL	P	SUR	913	4	0	1.5	-0.8	1.7
44777	58.8	-16.9	ALL	P	SUR	2068	15	1	1.6	-0.7	1.7
44811	41.1	-66.6	ALL	P	SUR	1	0	0	0.0	-1.8	1.8
62507	41.4	-27.2	ALL	P	SUR	1245	6	0	1.2	0.0	1.2
62508	43.8	-16.4	ALL	P	SUR	1270	5	0	1.3	-0.2	1.3
62509	45.8	-6.5	ALL	P	SUR	1116	0	0	0.8	0.0	0.8
62520	31.3	-34.7	ALL	P	SUR	999	3	0	1.0	-0.7	1.2
62596	58.5	-26.3	ALL	P	SUR	621	3	0	2.0	0.7	2.1
62597	57.2	-14.6	ALL	P	SUR	1248	4	0	1.5	-0.6	1.6
62705	55.0	-12.4	ALL	P	SUR	1	0	0	0.0	-2.1	2.1
62707	50.1	-6.1	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
62805	55.6	-12.9	ALL	P	SUR	1	0	0	0.0	-2.1	2.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62807	50.1	-6.1	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
62823	51.4	-7.7	ALL	P	SUR	2	0	0	0.5	-0.6	0.8
64517	58.5	-25.3	ALL	P	SUR	1274	0	0	1.7	-0.8	1.9
64518	59.5	-3.1	ALL	P	SUR	151	7	5	2.7	-0.5	2.8
64530	62.5	-4.6	ALL	P	SUR	1520	13	1	2.1	-0.8	2.2
64546	49.9	-38.2	ALL	P	SUR	351	0	0	1.8	-0.9	2.0
64698	57.1	-45.8	ALL	P	SUR	1079	82	8	1.9	-0.2	1.9
64699	61.2	-55.3	ALL	P	SUR	1089	16	1	2.9	-0.6	3.0
65593	59.9	-33.8	ALL	P	SUR	55	0	0	1.7	-0.3	1.7
65598	64.7	-28.9	ALL	P	SUR	1558	19	1	2.5	-0.3	2.5
65599	64.8	-32.0	ALL	P	SUR	2316	10	0	1.9	0.4	2.0
65600	64.1	-21.9	ALL	P	SUR	41	0	0	1.1	-6.7	6.8
65601	59.7	-33.1	ALL	P	SUR	381	1	0	1.1	-0.5	1.2
65602	58.3	-74.7	ALL	P	SUR	399	19	5	3.2	0.8	3.3
WIND SPEED											
41520	24.7	-56.8	ALL	SPEED	SUR	16	0	0	2.2	1.0	2.4
41521	28.6	-66.1	ALL	SPEED	SUR	279	0	0	1.7	-0.3	1.7
41625	23.7	-73.6	ALL	SPEED	SUR	241	0	0	1.5	-1.5	2.1
41630	19.4	-52.6	ALL	SPEED	SUR	252	0	0	2.1	0.2	2.1
41644	25.4	-46.3	ALL	SPEED	SUR	10	0	0	1.9	-6.1	6.4
41651	30.4	-76.3	ALL	SPEED	SUR	29	0	0	3.6	3.6	5.1
44607	52.6	-26.9	ALL	SPEED	SUR	629	0	0	2.7	0.9	2.9
44657	47.3	-59.9	ALL	SPEED	SUR	4	0	0	0.0	24.6	24.6
44721	59.5	-6.7	ALL	SPEED	SUR	1565	0	0	2.6	-1.5	3.0
44724	44.0	-38.9	ALL	SPEED	SUR	487	0	0	2.8	0.8	2.9
44725	43.2	-51.3	ALL	SPEED	SUR	302	0	0	3.1	0.9	3.2
44726	35.0	-51.3	ALL	SPEED	SUR	314	0	0	2.4	0.3	2.4
44727	35.3	-39.9	ALL	SPEED	SUR	318	0	0	2.9	1.2	3.1
44773	48.2	-41.1	ALL	SPEED	SUR	137	0	0	2.3	-6.0	6.4
44777	58.8	-16.9	ALL	SPEED	SUR	1545	0	0	2.7	-3.0	4.0
62506	36.0	-20.4	ALL	SPEED	SUR	632	0	0	1.8	0.7	1.9
62508	43.8	-16.4	ALL	SPEED	SUR	992	0	0	1.8	0.3	1.9
62597	57.2	-14.6	ALL	SPEED	SUR	1074	0	0	2.2	-1.1	2.5
62707	50.1	-6.1	ALL	SPEED	SUR	1	0	0	0.0	1.1	1.1
62805	55.6	-12.9	ALL	SPEED	SUR	1	0	0	0.0	-14.0	14.0
62823	51.4	-7.7	ALL	SPEED	SUR	2	0	0	0.8	1.3	1.5
WIND DIRECTION											
41520	24.7	-56.8	ALL	DIRN.	SUR	5	0	0	21.7	-35.4	41.6
41521	28.6	-66.1	ALL	DIRN.	SUR	203	0	0	18.3	-11.9	21.8
41625	23.7	-73.6	ALL	DIRN.	SUR	87	0	0	14.2	10.6	17.7
41630	19.4	-52.6	ALL	DIRN.	SUR	114	0	0	16.9	21.9	27.7
41651	30.4	-76.3	ALL	DIRN.	SUR	18	0	0	22.2	-12.0	25.2
44607	52.6	-26.9	ALL	DIRN.	SUR	470	0	0	23.1	6.2	23.9
44657	47.3	-59.9	ALL	DIRN.	SUR	4	0	0	0.0	-4.3	4.3
44721	59.5	-6.7	ALL	DIRN.	SUR	1156	0	0	22.1	3.9	22.5
44724	44.0	-38.9	ALL	DIRN.	SUR	377	0	0	21.7	-14.7	26.2
44725	43.2	-51.3	ALL	DIRN.	SUR	257	0	0	80.8	24.6	84.5
44726	35.0	-51.3	ALL	DIRN.	SUR	214	0	0	17.4	16.8	24.2
44727	35.3	-39.9	ALL	DIRN.	SUR	253	0	0	23.8	21.4	32.0
44773	48.2	-41.1	ALL	DIRN.	SUR	22	0	0	38.7	-20.5	43.8
44777	58.8	-16.9	ALL	DIRN.	SUR	1316	0	0	18.6	6.8	19.8
62506	36.0	-20.4	ALL	DIRN.	SUR	341	0	0	21.0	-10.0	23.3
62508	43.8	-16.4	ALL	DIRN.	SUR	588	0	0	15.0	-4.4	15.7
62597	57.2	-14.6	ALL	DIRN.	SUR	793	0	0	37.9	5.1	38.3
62707	50.1	-6.1	ALL	DIRN.	SUR	1	0	0	0.0	4.3	4.3
62823	51.4	-7.7	ALL	DIRN.	SUR	1	0	0	0.0	9.5	9.5

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3877	0	4	1.6	0.0	3839	0	4	0	7.6	1.0
ACA	1593	0	3	2.0	-0.1	1595	0	3	0	6.9	0.9
AEA	243	2	9	2.3	0.4	238	0	7	0	7.5	1.3
AEL	379	1	11	1.8	-0.5	380	0	11	0	7.0	0.6
AEY	52	2	4	1.4	0.5	53	0	2	0	6.1	0.7
AFL	425	1	3	1.6	0.0	422	1	4	0	8.2	0.2
AFR	1379	1	7	1.6	0.0	1393	0	9	0	8.1	1.1
AIH	232	2	3	1.7	0.0	239	0	2	0	6.5	0.8
AJM	110	0	4	2.1	-0.5	110	0	4	0	6.6	1.9
AMM	120	3	8	2.0	0.2	119	0	8	0	8.9	1.0
AMX	204	1	6	2.0	0.3	207	0	6	0	8.4	1.2
ANZ	160	0	9	2.0	-1.2	160	1	11	0	7.3	0.1
AOM	466	1	4	1.6	0.5	482	0	4	0	6.6	0.8
AUA	38	3	3	1.4	0.6	38	0	0	0	5.5	1.3
AVA	183	2	2	1.7	0.2	187	1	3	0	7.0	0.7
AZA	627	1	4	1.9	0.4	628	0	5	0	7.8	0.7
BAF	25	0	0	1.5	-0.9	25	0	0	0	5.8	1.4
BAL	215	1	11	1.6	-0.2	214	0	12	0	6.9	0.9
BAW	1500	1	6	1.9	0.0	1505	0	7	0	6.7	0.9
BBB	39	0	3	1.5	-0.5	38	0	5	0	8.8	2.5
BLX	24	0	0	0.9	-0.3	23	0	0	0	3.9	0.1
BWA	55	2	5	1.8	1.2	54	0	7	0	10.3	1.0
CDN	658	0	2	1.7	0.0	661	0	3	0	7.3	0.9
CFC	30	0	7	2.1	0.2	30	0	13	0	11.5	2.6
CFG	724	0	2	1.8	-1.1	742	0	3	0	7.4	0.8
CKS	35	0	0	1.4	0.1	36	0	0	0	6.9	1.0
CKT	60	0	10	1.4	1.1	64	0	14	0	8.4	0.8
CLX	317	0	2	1.6	-0.5	317	0	1	0	5.9	-0.5
CMM	101	1	7	2.7	0.8	94	0	2	0	6.7	1.3
COA	486	0	5	1.6	-0.2	482	0	10	0	12.0	1.9
CRL	394	1	4	1.6	0.8	400	0	5	0	6.7	0.7
CTB	109	0	2	1.5	-0.5	110	0	2	0	6.5	0.9
CUB	182	1	3	1.8	1.3	180	0	6	0	8.8	1.7
DAJ	21	0	0	1.3	0.4	22	0	0	0	8.1	1.2
DAL	1773	0	14	1.7	-0.6	1795	0	15	0	8.2	1.4
DBY	312	0	2	1.6	-0.7	309	0	3	0	7.6	0.7
DCS	57	0	5	1.6	-0.3	58	0	3	0	5.8	-0.6
DLH	1769	0	5	1.7	0.0	1773	0	6	0	7.1	0.7
EEZ	204	4	100	5.2	3.8	204	0	11	0	8.4	1.0
EIN	42	2	5	1.4	-0.6	41	0	2	0	5.3	-0.2
ELY	162	1	3	1.3	-0.4	167	0	5	0	8.9	1.2
ETH	24	0	13	1.5	0.1	24	0	13	0	7.2	1.5
EWW	74	0	5	1.7	0.1	75	0	7	0	8.2	2.2
FDX	611	0	7	1.7	0.3	623	0	8	0	8.4	1.0
FIN	468	0	4	1.9	0.2	467	0	6	0	8.4	0.8
GAF	74	0	0	1.8	-1.0	74	0	1	0	8.8	1.4
GCO	43	2	5	0.9	0.4	46	0	17	0	18.2	3.6
GRL	76	0	1	1.9	0.1	77	0	0	0	5.6	-0.8
GTI	209	0	6	1.8	-0.7	213	0	7	0	7.5	1.1
HLF	59	3	10	1.6	-1.0	59	0	7	0	5.7	0.4
IBE	1357	1	10	2.0	0.5	1330	0	11	0	8.6	0.9
ICE	1325	0	3	1.7	0.0	1312	0	4	0	7.7	1.2
IRL	26	0	4	2.8	2.0	28	0	0	0	7.5	2.0
IWD	87	1	8	1.8	0.1	88	0	7	0	7.7	0.4
JKK	212	1	4	1.4	0.0	191	0	6	0	8.7	1.5
JMC	24	0	8	2.7	1.7	20	0	15	0	7.6	-0.1
KLM	1982	0	9	1.6	0.1	1996	0	10	0	7.8	0.9
LDA	112	2	7	1.5	-0.3	117	0	7	0	8.8	1.7
LDI	525	1	100	2.5	0.3	520	0	12	0	7.9	0.1

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
LIB	138	1	2	1.8	1.2	139	1	3	0	7.8	0.8
LOT	246	0	6	2.0	-1.1	243	0	5	0	9.3	0.6
LTE	21	0	0	1.8	-0.6	21	0	0	0	6.2	1.1
LTU	540	0	4	1.8	-0.3	532	0	5	0	7.9	1.2
MAS	56	2	5	1.9	0.0	56	0	5	0	10.4	1.9
MON	108	2	5	1.8	-0.2	107	0	3	0	7.1	0.7
MPD	114	0	10	2.1	0.3	114	0	11	0	9.0	1.3
MPH	624	0	3	1.9	-0.7	628	0	3	0	7.4	0.9
NCA	28	0	0	1.1	0.1	28	0	0	0	6.6	-0.7
NVR	56	0	4	2.2	0.2	57	0	2	0	5.1	-0.2
NWA	2995	0	2	1.6	0.3	2903	0	2	0	7.8	0.5
OAL	30	3	7	2.0	-0.5	30	0	0	0	6.9	1.1
PAC	72	0	8	2.7	0.5	75	0	32	0	6.7	1.8
RAM	47	0	11	1.5	-0.6	47	0	17	0	10.6	-0.5
RCH	135	1	4	1.8	0.8	139	0	70	0	10.5	1.4
RJA	41	2	2	1.3	-0.5	42	0	5	0	11.4	2.6
RRR	125	3	18	1.8	-0.3	129	1	15	0	6.4	1.0
RZO	41	2	2	2.0	-0.8	41	0	2	0	7.5	1.3
SAB	60	0	5	2.0	-0.9	60	0	3	0	6.3	1.7
SAS	1621	0	35	1.7	-0.4	1621	0	35	0	7.3	0.5
SIA	96	1	7	2.2	-1.0	97	0	3	0	5.7	0.0
SLR	146	0	16	1.8	-1.1	146	0	16	0	6.9	1.0
SNB	91	0	7	2.4	0.1	92	0	4	0	6.6	-0.1
SVA	153	1	8	1.9	-0.3	157	0	8	0	7.3	0.6
SWR	145	1	3	1.4	0.2	145	1	6	0	10.0	1.6
TAP	299	1	6	1.7	-0.1	296	0	6	0	9.0	1.2
TOW	58	2	5	1.0	-0.3	59	0	5	0	8.9	0.7
TSC	36	6	11	1.6	0.6	36	0	6	0	6.4	-0.1
TWA	849	0	3	1.7	-0.1	804	0	3	0	7.9	1.5
UAL	1983	0	42	1.8	-0.2	2022	0	42	0	6.6	0.6
UPS	715	0	9	1.7	0.4	723	0	9	0	7.6	0.8
USA	348	0	2	1.6	-0.2	292	0	2	0	6.6	1.1
VIR	768	1	2	1.7	-0.2	773	0	2	0	7.0	0.6
VKG	163	0	2	1.9	-0.2	166	0	2	0	5.9	0.5
VPB	28	0	0	2.3	1.1	29	0	0	0	7.4	0.4
WOA	89	0	4	1.8	0.1	91	0	7	0	8.8	2.4
BA	1178	0	6	1.3	0.5	1168	0	7	0	5.4	0.4
EU	18060	0	17	1.4	-0.1	18060	0	17	0	5.6	0.5
KL	3980	0	9	1.4	0.7	3981	0	9	0	6.2	0.7
N	340	2	4	2.4	0.7	352	0	3	0	7.4	0.9
US ACARS	14767	0	20	1.4	0.5	14767	0	20	0	6.2	0.7

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	10	0	21.7	36.1	28.9
ELML7	12	Z	100	13	0	17.1	35.6	31.2
FNOR	00	Z	100	12	0	18.4	36.9	32.0
FNOR	12	Z	100	11	0	13.0	22.9	18.8
FNOU	00	Z	100	7	0	17.9	23.5	15.3
FNOU	12	Z	100	8	0	10.5	18.9	15.8
FNPH	00	Z	100	11	0	13.1	22.5	18.4
FNPH	12	Z	100	10	0	17.5	17.8	3.2
FNRS	00	Z	100	8	0	9.7	24.7	22.8
FNRS	12	Z	100	7	0	15.9	17.4	7.0
LDWR	00	Z	100	29	0	17.5	18.9	-7.2
LDWR	12	Z	100	24	0	13.6	15.0	-6.5
OVYA2	00	Z	100	15	0	16.6	16.6	0.4
OVYA2	12	Z	100	18	0	20.3	20.3	-0.7
OXTS2	00	Z	100	14	0	20.0	20.1	0.9
OXTS2	12	Z	100	15	0	15.9	18.6	9.6
ZCBP6	00	Z	100	6	0	6.0	31.6	31.0
ZCBP6	12	Z	100	5	0	21.1	31.1	22.8
03953	00	Z	100	30	0	12.0	24.6	21.5
03953	12	Z	100	31	0	11.7	17.2	12.6
04018	00	Z	100	28	0	18.3	22.8	13.6
04018	12	Z	100	30	0	24.5	25.2	6.0
04220	00	Z	100	29	0	34.3	43.2	26.3
04220	12	Z	100	29	0	30.5	36.9	20.7
04270	00	Z	100	27	0	31.9	35.2	14.8
04270	12	Z	100	30	0	23.3	23.5	3.4
04339	00	Z	100	29	0	22.2	29.4	19.3
04339	12	Z	100	29	0	22.3	24.3	9.6
04360	00	Z	100	27	0	22.1	24.5	10.5
04360	12	Z	100	29	0	26.0	26.4	4.6
08001	00	Z	100	29	1	16.4	17.9	-7.3
08001	12	Z	100	30	0	26.3	33.9	-21.4
08508	00	Z	100	28	0	15.0	28.6	24.3
08508	12	Z	100	30	0	34.5	37.2	13.8
08522	12	Z	100	29	0	14.6	14.8	2.5
08594	12	Z	100	21	0	13.8	36.9	34.2
71600	00	Z	100	29	0	14.2	22.4	17.3
71600	12	Z	100	29	0	14.9	15.5	4.2
72201	00	Z	100	29	0	22.2	37.7	30.5
72201	12	Z	100	31	0	31.6	43.3	29.6
72402	00	Z	100	29	0	11.1	34.1	32.3
72402	12	Z	100	30	0	15.3	36.7	33.3
74494	00	Z	100	22	0	6.8	12.6	10.6
74494	12	Z	100	27	0	13.5	16.0	-8.7
78016	00	Z	100	1	0	0.0	38.0	38.0
78016	12	Z	100	27	0	15.1	32.4	28.6

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	500	15	0	10.8	14.4	9.5
ELML7	12	Z	500	18	0	11.6	17.8	13.6
FNOR	00	Z	500	13	0	17.0	20.8	11.9
FNOR	12	Z	500	11	0	9.3	16.0	13.0
FNOU	00	Z	500	10	0	6.3	15.4	14.0
FNOU	12	Z	500	12	0	11.0	16.3	12.0
FNPH	00	Z	500	14	0	11.9	13.7	6.9
FNPH	12	Z	500	13	0	10.0	12.6	7.7
FNRS	00	Z	500	11	0	7.9	8.8	3.9
FNRS	12	Z	500	8	0	8.2	9.8	5.4
LDWR	00	Z	500	30	0	11.0	11.1	-1.3
LDWR	12	Z	500	26	0	10.5	11.6	-5.0
OVYA2	00	Z	500	19	0	7.8	14.5	12.2
OVYA2	12	Z	500	19	0	12.2	13.4	5.5
OXTS2	00	Z	500	19	0	27.7	27.7	-0.5
OXTS2	12	Z	500	15	0	14.4	14.4	-0.1
ZCBP6	00	Z	500	6	0	9.3	17.2	14.5
ZCBP6	12	Z	500	5	0	11.2	28.5	26.2
03953	00	Z	500	30	0	6.7	15.5	14.0
03953	12	Z	500	31	0	5.9	15.1	13.9
04018	00	Z	500	30	0	13.8	22.9	18.3
04018	12	Z	500	31	0	20.4	21.0	5.1
04220	00	Z	500	29	0	13.6	18.9	13.1
04220	12	Z	500	30	0	13.0	14.4	6.2
04270	00	Z	500	29	0	14.7	17.9	10.2
04270	12	Z	500	31	0	13.9	15.1	6.0
04339	00	Z	500	29	0	17.2	23.2	15.7
04339	12	Z	500	29	0	18.8	20.1	7.0
04360	00	Z	500	27	0	14.7	17.6	9.7
04360	12	Z	500	29	0	15.0	15.4	3.5
08001	00	Z	500	29	1	8.5	10.3	5.8
08001	12	Z	500	30	0	15.1	15.8	-4.5
08508	00	Z	500	29	0	9.2	13.2	9.5
08508	12	Z	500	30	1	21.0	22.0	6.6
08522	12	Z	500	30	0	8.2	14.4	11.8
08594	12	Z	500	22	0	7.1	8.6	4.8
60020	00	Z	500	26	0	6.7	13.7	12.0
60020	12	Z	500	28	0	7.8	13.8	11.3
71600	00	Z	500	29	0	18.8	19.9	6.5
71600	12	Z	500	29	0	14.7	16.1	6.7
72201	00	Z	500	30	0	7.5	9.6	6.0
72201	12	Z	500	31	0	9.0	9.3	-2.4
72402	00	Z	500	30	0	10.0	14.1	9.9
72402	12	Z	500	31	0	9.0	11.0	6.2
74494	00	Z	500	29	0	9.3	12.1	7.8
74494	12	Z	500	30	0	8.9	9.0	1.4
78016	00	Z	500	1	0	0.0	15.0	15.0
78016	12	Z	500	28	0	8.0	16.7	14.6

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	11	0	0	5.7	-1.3	-1.8
ELML7	12	V	100	12	0	0	7.6	0.0	0.7
FNOR	00	V	100	11	0	0	5.2	1.9	0.9
FNOR	12	V	100	10	0	0	6.3	2.2	-1.7
FNOU	00	V	100	10	0	0	4.3	2.2	-0.2
FNOU	12	V	100	10	0	0	3.0	0.7	-0.5
FNPH	00	V	100	13	0	0	4.7	2.1	-1.0
FNPH	12	V	100	6	0	0	5.7	2.1	-1.8
FNRS	00	V	100	8	0	0	4.6	-1.8	0.9
FNRS	12	V	100	6	0	0	3.6	1.3	0.6
LDWR	00	V	100	28	1	3	38.3	4.3	-6.8
LDWR	12	V	100	23	0	0	3.5	-1.5	-1.0
OVYA2	00	V	100	13	0	0	4.5	0.9	-0.3
OVYA2	12	V	100	17	0	0	3.4	1.2	0.2
OXTS2	00	V	100	6	0	0	2.3	1.0	-0.7
OXTS2	12	V	100	9	0	0	3.9	0.1	0.3
ZCBP6	00	V	100	7	0	0	3.6	0.9	-2.5
ZCBP6	12	V	100	5	0	0	4.7	-0.8	2.4
03953	00	V	100	31	0	0	3.0	1.0	-0.4
03953	12	V	100	31	0	0	3.1	0.6	0.4
04018	00	V	100	24	0	0	4.1	-0.3	0.2
04018	12	V	100	28	0	0	4.9	-0.1	-1.0
04220	00	V	100	29	0	0	5.0	-1.4	0.1
04220	12	V	100	28	0	0	4.5	-1.2	0.6
04270	00	V	100	27	0	3	8.0	-2.1	0.9
04270	12	V	100	29	0	6	7.9	-1.7	-0.7
04339	00	V	100	27	0	0	5.3	-0.3	-0.7
04339	12	V	100	29	0	0	5.2	1.1	-1.6
04360	00	V	100	28	0	3	7.5	-0.7	0.9
04360	12	V	100	27	0	0	5.2	0.2	-1.0
08001	00	V	100	31	0	0	3.8	0.6	-1.2
08001	12	V	100	28	0	0	4.7	1.2	-0.8
08508	00	V	100	15	0	0	4.5	0.5	1.2
08508	12	V	100	14	0	0	3.8	0.0	-0.2
08522	12	V	100	27	0	0	5.0	0.7	0.6
08594	12	V	100	23	0	100	7.2	-3.0	1.7
71600	00	V	100	30	0	0	3.2	0.1	-0.2
71600	12	V	100	29	0	0	3.6	0.3	-0.5
72201	00	V	100	29	0	0	4.7	-0.1	-0.7
72201	12	V	100	30	0	0	4.8	-0.6	0.9
72402	00	V	100	29	0	0	5.7	0.6	0.4
72402	12	V	100	30	0	0	4.1	0.4	0.0
74494	00	V	100	22	0	0	3.0	0.7	0.3
74494	12	V	100	25	0	0	2.6	0.3	-0.2
78016	00	V	100	2	0	0	6.9	5.8	-3.1
78016	12	V	100	27	0	0	6.4	3.1	0.4

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	500	14	0	0	3.0	0.5	-1.4
ELML7	12	V	500	15	0	0	2.7	-0.2	-1.1
FNOR	00	V	500	13	0	0	3.5	-1.4	-0.7
FNOR	12	V	500	12	0	0	4.2	-0.6	0.2
FNOU	00	V	500	11	0	0	4.8	-1.4	-2.6
FNOU	12	V	500	12	0	0	4.9	0.0	0.5
FNPH	00	V	500	14	0	0	3.9	-0.8	0.7
FNPH	12	V	500	8	0	0	4.2	0.7	0.6
FNRS	00	V	500	8	0	0	5.1	-2.7	-0.6
FNRS	12	V	500	7	0	0	5.6	0.7	0.2
LDWR	00	V	500	31	0	0	4.0	0.6	-0.5
LDWR	12	V	500	26	0	0	3.6	0.3	-0.7
OVYA2	00	V	500	16	0	0	3.7	0.9	0.0
OVYA2	12	V	500	15	0	0	3.7	0.3	-1.0
OXTS2	00	V	500	18	0	0	4.9	0.1	-0.5
OXTS2	12	V	500	11	0	0	4.3	0.8	0.7
ZCBP6	00	V	500	6	0	0	4.2	-0.6	0.1
ZCBP6	12	V	500	5	0	0	3.6	-0.1	1.0
03953	00	V	500	31	0	0	3.7	0.3	-0.9
03953	12	V	500	31	0	0	3.5	0.4	-1.2
04018	00	V	500	31	0	0	5.4	0.1	0.0
04018	12	V	500	30	0	0	3.9	2.2	-0.4
04220	00	V	500	30	0	0	4.4	-0.2	0.5
04220	12	V	500	30	0	0	6.0	-0.1	1.7
04270	00	V	500	30	0	0	4.1	-0.2	0.7
04270	12	V	500	31	0	0	4.4	0.1	0.1
04339	00	V	500	24	0	0	6.6	1.2	-0.3
04339	12	V	500	29	0	0	5.9	0.9	-1.7
04360	00	V	500	28	0	3	8.5	-3.0	0.1
04360	12	V	500	29	0	0	5.8	-1.5	-0.5
08001	00	V	500	31	0	0	4.3	0.7	-0.7
08001	12	V	500	30	0	0	4.0	0.9	-0.1
08508	00	V	500	16	0	0	3.7	-0.3	0.4
08508	12	V	500	14	0	0	4.0	-0.5	-0.1
08522	12	V	500	30	0	0	4.1	0.6	-0.6
08594	12	V	500	24	0	100	6.2	0.1	1.5
60020	00	V	500	27	0	0	3.5	0.6	0.2
60020	12	V	500	26	0	0	4.2	0.2	-1.6
71600	00	V	500	30	0	0	4.5	0.5	0.5
71600	12	V	500	29	0	0	4.8	0.3	1.1
72201	00	V	500	31	0	0	4.3	0.4	0.7
72201	12	V	500	31	0	0	3.5	0.2	0.0
72402	00	V	500	30	0	0	4.4	-0.4	0.7
72402	12	V	500	30	0	0	4.3	1.5	0.6
74494	00	V	500	30	0	0	3.8	-0.6	0.0
74494	12	V	500	29	0	0	4.4	1.1	1.0
78016	00	V	500	2	0	0	6.3	4.0	-4.1
78016	12	V	500	28	0	0	4.1	0.9	0.6

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45